PETROLEUM WEEK

NOVEMBER 15, 1957

■ A McGRAW-HILL PUBLICATION

Talk of crude price cut dims API meet 23
Oil integration under new attack 23
Oil's biggest worry is how to cut costs 26
Voluntary imports controls must work 36
Standardization improves efficiency 38
U.S. may O.K. joint foreign production 69
New poly process has liquid catalyst 70
Radiation processing glows brighter 99
Barges are losing out to pipelines 136
Does graduate work help engineers? 154
Motor tuneups hike station revenues 166

Price 50 Cents

Financing from the **FIRST** *in Dallas goes where you go!*

Specialized experience, organization, and resources to help you with practically any kind of need for "working money".

FIRST NATIONAL BANK in Dallas
Member Federal Deposit Insurance Corporation

GIVE US AN OPPORTUNITY TO SAY · YES ·

put FIRST financing in your own oil future

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Style WH Oil Suction & Discharge Hose (RB)
A
B
C
D
A Helix of flat, noncarroding, galvanized steel wire plus ply of heavy fabric coated with oil-resistant compound
B Tube of gasoline- and oil-resistant synthetic rubber
C Reinforcing plies of heavy fabric plus helix of round steel wire
D Oil-, age-, abrasion- and weather-resistant cover

Nearly three times the service — and still going strong!

Tankers are serviced very rapidly at this Texas dock. Standard operation is to load 138,000 barrels of gasoline in just 10 hours. Also standard is a test of the hose at periodic intervals to determine whether it can continue in service handling the highest test petroleum products or whether it should be relegated to low pressure, bunker or utility service.

Over eight years ago, the G.T.M.—Goodyear Technical Man – specified his Style WH Oil Suction and Discharge Hose for this service. At last report, this husky, 150-pound working pressure hose had repeatedly passed the high requirements of the exacting periodic tests and was well on its way toward delivering three times the expected service, handling gasoline, aviation gasoline, and solvents under high pressure.

If you're looking for the unusual in oil hose life, why not look up the G.T.M.? You'll find he carries a complete line of oil hose from which to specify the right types for your needs at lowest end cost. And he's readily available through your Goodyear Distributor or:

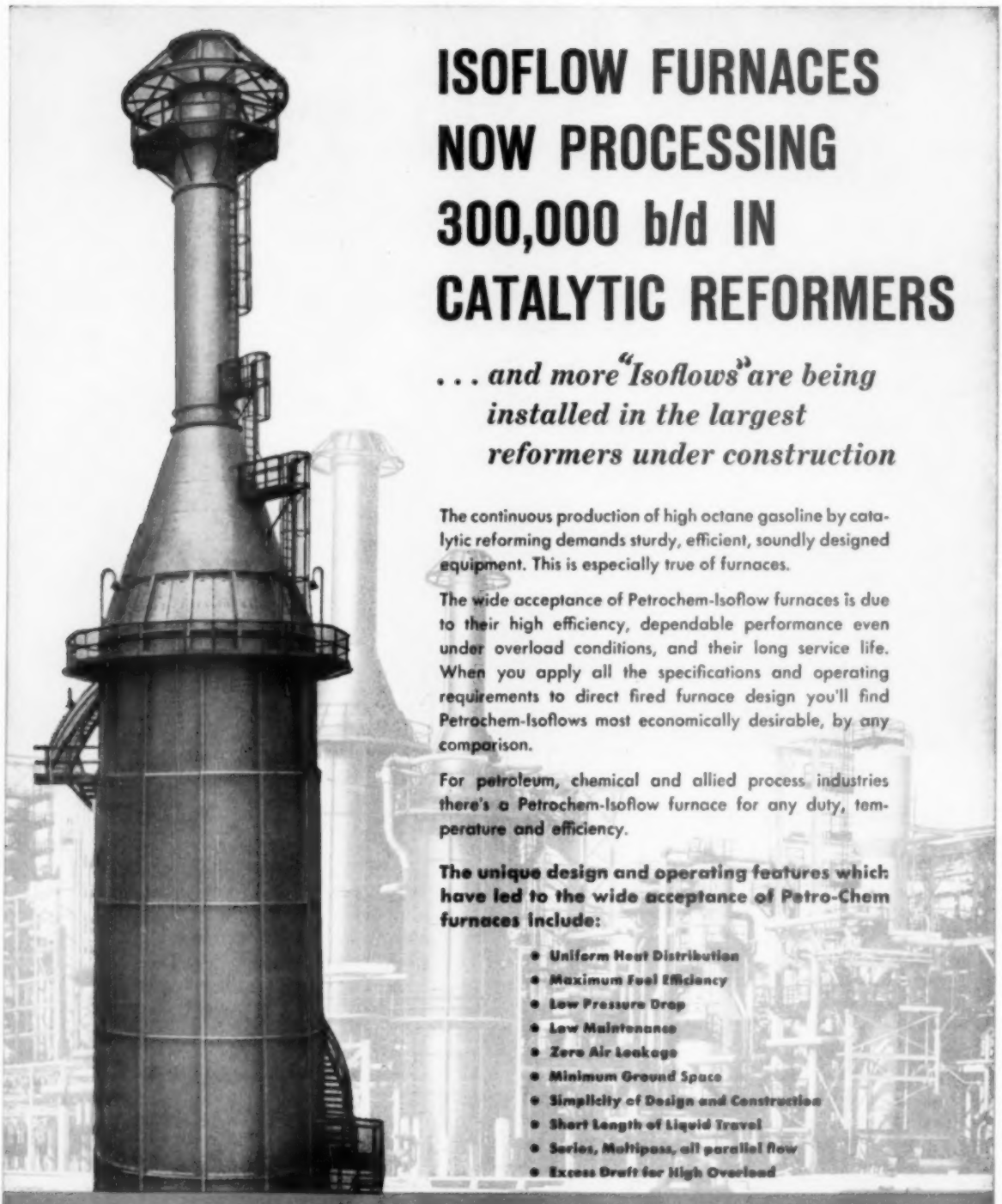
Goodyear, Industrial Products Division
Akron 16, Ohio

OIL SUCTION and DISCHARGE HOSE by

GOODYEAR

THE GREATEST NAME IN RUBBER

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*



ISOFLOW FURNACES NOW PROCESSING 300,000 b/d IN CATALYTIC REFORMERS

. . . and more "Isoflows" are being installed in the largest reformers under construction

The continuous production of high octane gasoline by catalytic reforming demands sturdy, efficient, soundly designed equipment. This is especially true of furnaces.

The wide acceptance of Petrochem-Isoflow furnaces is due to their high efficiency, dependable performance even under overload conditions, and their long service life. When you apply all the specifications and operating requirements to direct fired furnace design you'll find Petrochem-Isoflows most economically desirable, by any comparison.

For petroleum, chemical and allied process industries there's a Petrochem-Isoflow furnace for any duty, temperature and efficiency.

The unique design and operating features which have led to the wide acceptance of Petro-Chem furnaces include:

- **Uniform Heat Distribution**
- **Maximum Fuel Efficiency**
- **Low Pressure Drop**
- **Low Maintenance**
- **Zero Air Leakage**
- **Minimum Ground Space**
- **Simplicity of Design and Construction**
- **Short Length of Liquid Travel**
- **Series, Multipass, all parallel flow**
- **Excess Draft for High Overload**

PETROCHEM-ISOFLOW FURNACES

UNLIMITED IN SIZE . . . CAPACITY . . . DUTY

PETRO-CHEM DEVELOPMENT CO., INC. • 122 EAST 42nd St., New York 17, N. Y.

REPRESENTATIVES:

Rawson & Co., Houston • Wm. H. Mason Co., Tulsa • Lester Oberholtz, Los Angeles • Pavillo-Lovalty, Chicago • D. D. Foster, Pittsburgh • Turbex, Philadelphia • Flagg, Brockett & Durgin, Boston • G. M. Wallace & Co., Denver & Salt Lake City

International Licensees and Representatives: SETEA—S.A. Comercial, Industrial, y de Estudios Tecnicos, Buenos Aires, Argentina • Industrial Provedora, Caracas, Venezuela • Societe Anonyme Heurtey, Paris, France • Societe Anonyme Belge, Liege, Belgium • Petrochem G.M.B.H., Dortmund, Germany • Heurtey Italiana S.P.A., Milan, Italy • Heurtey Ltd., Birmingham, England

PETROLEUM WEEK

Publisher—Harry L. Waddell
Editor—LeRoy Menzing
Assistant to the Publisher—William F. Bland

Managing Editor—Richard M. Machol
Senior Editors—Glenn Green, Jr. (Houston), Wanda M. Jablonski, Robert E. Spann, John Barton, Robert L. Davidson, Halsey Peckworth
News Editor—Clyde LaMotte
Foreign News Editor—Georgia Macris
Assistant Editors—John Paluszek, Ade Ponikvar, Betty Deane Suiter
District Editors
Bakersfield—William Rintoul
Chicago—Randall Walthius
Houston—Eugene Bush
Tulsa—William P. Sterne
Presentation—William A. Caperell, Jr., director; Mildred Schutte
Editorial Assistants—Larry Christiansen, Jr., Vivian Lunardi, Mark M. Garbarini (Chicago), Barbara Farnsworth, Marcia Fink
Domestic News Service
Atlanta Bureau—Charles T. Dixon, chief, Frances Ridgway
Cleveland Bureau—William G. Meldrum, chief, Michelle M. Perry
Dallas Bureau—Kemp Anderson, Jr., chief, Lorraine Smith
Detroit Bureau—Donald MacDonald, chief, Nancy Ann Moore
Los Angeles Bureau—John K. Shinn, Michael J. Murphy
San Francisco Bureau—Margaret Ralston, chief, Jenness Keene, Sue Johnson
Washington Bureau—George B. Bryant, Jr., chief, Glen Bayless, Ernest Conine, A. R. Patla, D. O. Loomis Roy Calvin, N. B. Musselman, Dean Reed, Arthur Kraft, Seth Payne
Correspondents: Albuquerque, Austin, Baton Rouge, Billings, Bismarck, Calgary, Casper, Cheyenne, Corpus Christi, Denver, Edmonton, Farmington (N.M.), Ft. Worth, Great Falls, Honolulu, Jackson (Miss.), Lake Charles, Memphis, Midland, Minneapolis, Mobile, Montreal, New Orleans, Odessa, Oklahoma City, Philadelphia, Phoenix, Pittsburgh, Portland (Ore.), Regina, Sacramento, Salt Lake City, San Diego, Seattle, Shreveport, Spokane, Vancouver, Winnipeg
Foreign News Service
Middle East Bureau—Onnic Marashian, chief
Caracas Bureau—John Pearson, chief
Bonn Bureau—Morrie Helitzer, chief, Thomas Berendt, Silke Brueckler
London Bureau—William Coughlin, chief, John Tunstall, Robert Gibson
Mexico City Bureau—John H. Kearney, chief
Paris Bureau—Robert E. Farrell, chief, Helen Avati
Rio de Janeiro Bureau—Peter Weaver, chief
Tokyo Bureau—Dan Kurzman, chief
Correspondents: Amsterdam, Baghdad, Beirut, Bogota, Bombay, Brussels, Buenos Aires, Cairo, Colombo, Djakarta, Geneva, Guatemala City, Havana, Helsinki, Istanbul, Johannesburg, Karachi, La Paz, Lima, Manila, Melbourne, Rangoon, Rome, San Jose, Stockholm, Vienna
Manager, McGraw-Hill World News Service—John Wilhelm
Economics Staff
Dexter M. Keezer, director; Robert P. Ulin, T. C. Boyden
Business Department
Advertising Sales Manager—Ervin E. DeGraff; *Western General Manager*—Donald O. Hanson; *Acting Circulation Manager*—Harriet Costikyan; *Promotion Manager*—N. F. Cullinan; *Advertising Service Manager*—John E. Thompson; *Research Manager*—Leo M. Murray; *Southwestern Research Manager*—George Reid
Other McGraw-Hill Petroleum Publications
NATIONAL PETROLEUM NEWS
PLATT'S OILGRAM NEWS AND PRICE SERVICES

PETROLEUM WEEK

NOVEMBER 15, 1957
Vol. 5, No. 20

Number of copies of this issue printed: **49,039**

Published weekly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), founder. Publication office: 871 N. Franklin St., Chicago 10, Ill. See panel below for directions regarding subscriptions or change of address.

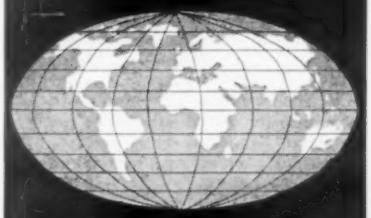
Executive Editorial, Circulation and Advertising Offices: 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

Subscriptions are solicited only from executives, supervisors, and such technically trained personnel as engineers, geologists, chemists, etc., in the oil and natural gas industries, who are engaged in exploration, drilling, producing, processing, petrochemical manufacture, transportation, or wholesale marketing. **Position and company connection must be indicated on subscription orders.** Subscription rate for all countries: $3 per year. Single Copies 50c. Second class mail privileges authorized at Chicago, Ill. Printed in U.S.A. Title registered in U. S. Patent Office, © Copyright 1957 by McGraw-Hill Publishing Co., Inc. All rights reserved.

Subscriptions: Address subscription correspondence and change of address to Subscription Manager, Petroleum Week, 330 W. 42nd St., N. Y. 36, N. Y. On address changes, please give old and new address and zone numbers, if any, and enclose an address label from a recent issue if possible. Please allow one month for change to become effective.

Postmaster: Please send form 3579 to Petroleum Week, 330 W. 42nd St., New York 36, N. Y.

TO OIL MEN THE WORLD OVER



The "Oil Bank" of the Southwest

WHAT CAN *WE* DO FOR *YOU?*

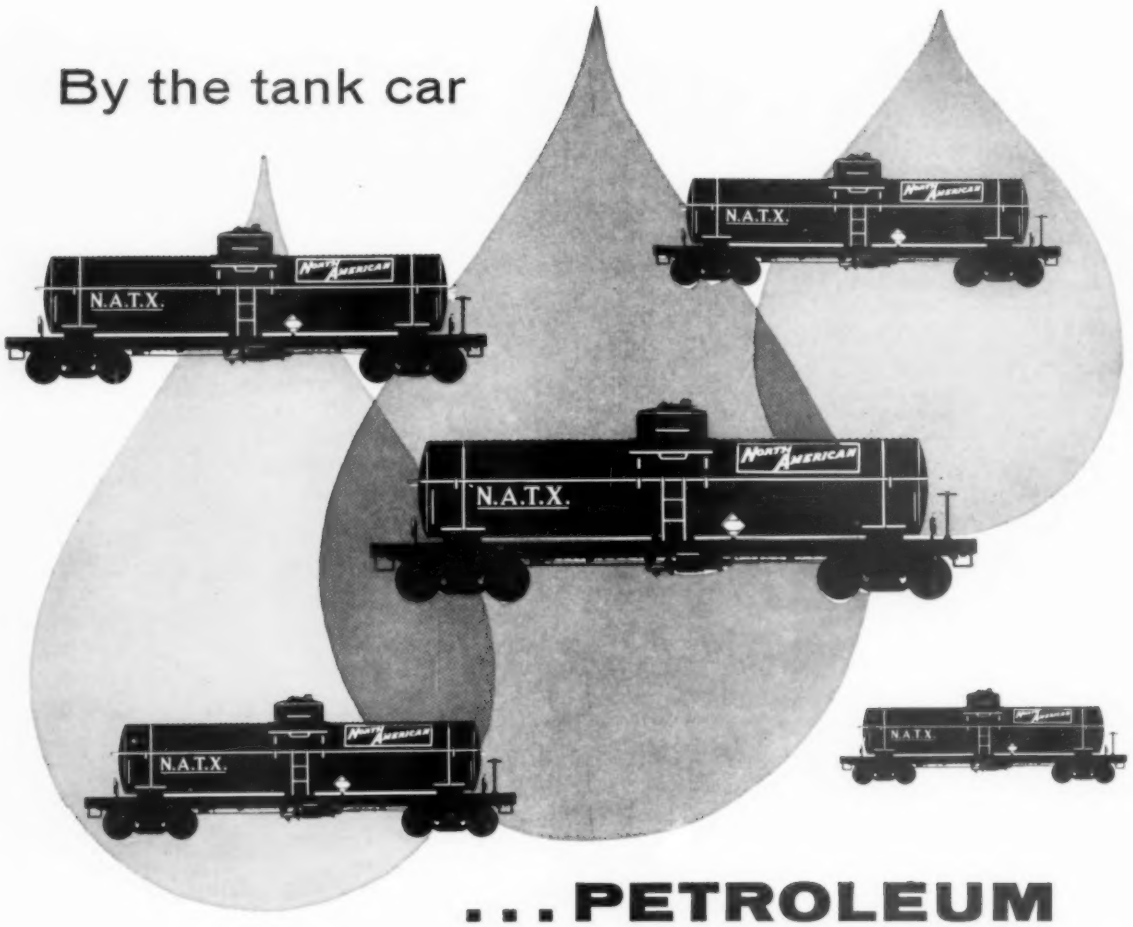
REPUBLIC National BANK of Dallas

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

CAPITAL AND SURPLUS $75,000,000

LARGEST IN THE SOUTH

By the tank car



. . . PETROLEUM FOR YOUR CUSTOMERS

and plenty of goodwill for you!

Your North American tank cars are where you want 'em, when you want 'em . . . kept on the move by nine big repair and conditioning shops for dependable service. When you lease our equipment, you're assured of a continuous car supply for better planning, improved shipping, more satisfied customers. Your transportation needs are our business. If we haven't the cars you need, we'll be glad to build you special ones . . . and then lease them to you.

NORTH AMERICAN CAR CORPORATION

NORTH WESTERN REFRIGERATOR LINE COMPANY

MATHERS HUMANE STOCK TRANSPORTATION COMPANY

231 South LaSalle Street, Chicago 4, Illinois

A NATIONWIDE ORGANIZATION WITH BRANCH OFFICES IN IMPORTANT MARKET CENTERS

DALLAS • FOND DU LAC • ST. PAUL • ST. LOUIS • TULSA • SAN FRANCISCO • NEW YORK

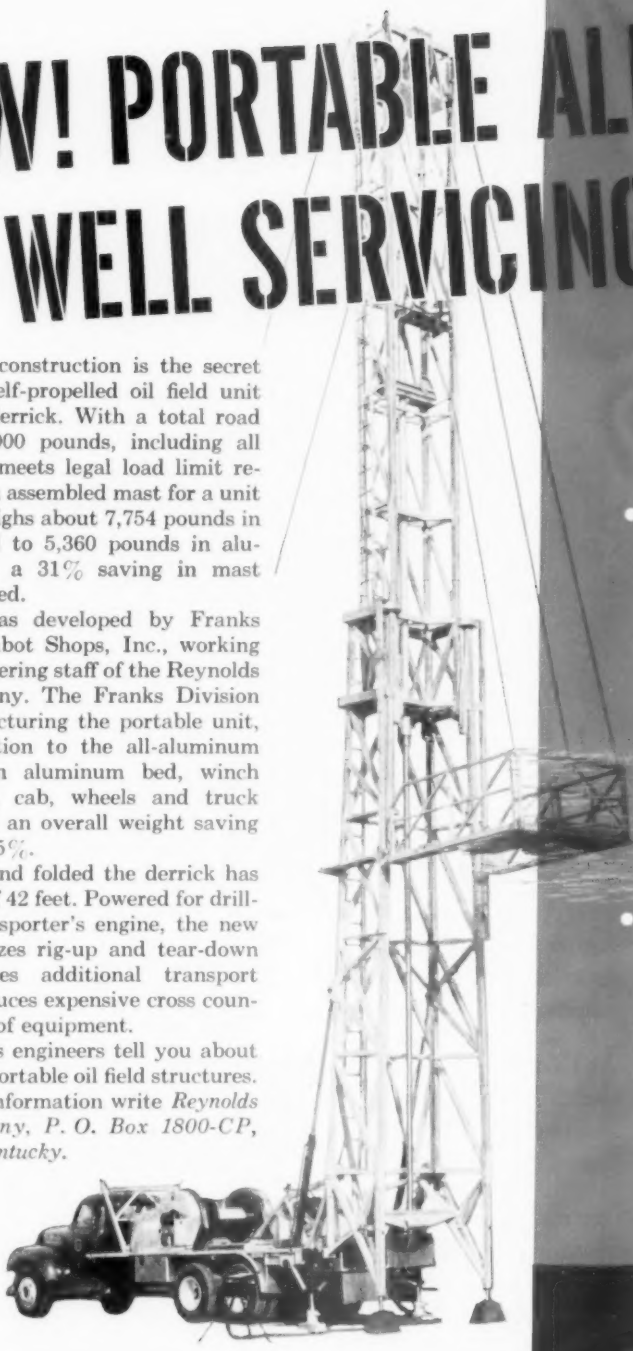
NEW! PORTABLE ALUMINUM WELL SERVICING RIG

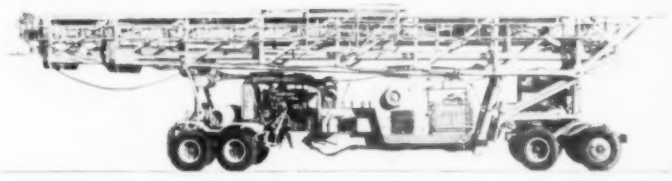
All-aluminum construction is the secret of this new, self-propelled oil field unit with 68 foot derrick. With a total road weight of 37,000 pounds, including all equipment, it meets legal load limit requirements. An assembled mast for a unit of this type weighs about 7,754 pounds in steel compared to 5,360 pounds in aluminum. Thus, a 31% saving in mast weight is realized.

The unit was developed by Franks Division of Cabot Shops, Inc., working with the engineering staff of the Reynolds Metals Company. The Franks Division is now manufacturing the portable unit, which in addition to the all-aluminum derrick has an aluminum bed, winch frame, guards, cab, wheels and truck bogie, effecting an overall weight saving of more than 15%.

Telescoped and folded the derrick has a road length of 42 feet. Powered for drilling by its transporter's engine, the new derrick minimizes rig-up and tear-down time, eliminates additional transport equipment, reduces expensive cross country movement of equipment.

Let Reynolds engineers tell you about aluminum for portable oil field structures. For complete information write *Reynolds Metals Company, P. O. Box 1800-CP, Louisville 1, Kentucky.*





- meets legal road limit requirements
- reduces rig-up and tear-down time

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV.

We're human... we like to explore the secrets of science, too!

Everybody is inherently a researcher. The instinct for seeking new frontiers is as human as tears and laughter. And occasionally a few of us become so enthusiastic over such searches that they become our life work.

At UOP we have just such a group of men—men who have dedicated themselves to searching out scientific ways and means of getting the utmost from every drop of crude oil that comes out of the ground.

For more than forty years Universal research has progressively developed and made available to refiners everywhere new and improved processes for producing better motor-fuels and by-products from petroleum.

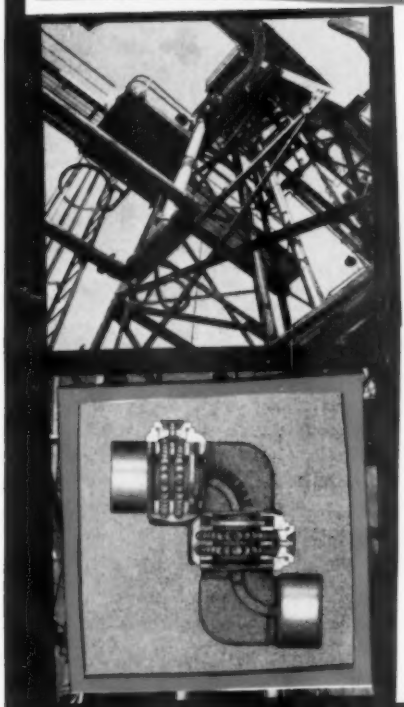
UOP® UNIVERSAL OIL PRODUCTS COMPANY

30 ALGONQUIN ROAD, DES PLAINES, ILLINOIS, U. S. A.

FORTY YEARS OF LEADERSHIP IN PETROLEUM REFINING TECHNOLOGY

CHIKSAN HELPS UNION OIL CUT OUT THE COKE

Swiveling Chiksan Decoking Arms combine flexibility and stamina to handle 1700 psi hydraulic water force used to remove petroleum coke from coke drums



During refining of crude stock at Union Oil's Oleum refinery, petroleum coke is produced as a valuable by-product. When coke drums become full, they are "decoked" with a high pressure water jet which first drills out a pilot hole, then cuts the coke loose, moving it out of the tower in slurry form. Safety dictates all metal flexible lines. The solution—Chiksan Swivel-Jointed All Steel Decoking Arms. These rugged units provide free turning rotation with all movement carried out in a predetermined arc. Service life of the Chiksan Decoking Arms is measured in years and maintenance involves an occasional packing replacement. If your equipment or plant lines require flexibility, let Chiksan swivel joints provide the answer with less maintenance, limited replacements, and the safety that only steel can provide. Write today for literature and price lists.

LOOK INSIDE A SWIVEL JOINT. Detailed attention to detail. Precision machining and specific packing seals for specific services. These are the quality-plus features built into every Chiksan Swivel Joint.

PLEASE ADDRESS DEPT. 1311

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

fmc CHIKSAN

CHIKSAN COMPANY—BREA, CALIFORNIA • CHICAGO 5, ILLINOIS • NEWARK 2, NEW JERSEY

Well Equipment Mfg. Corp. (Division) Houston 1, Texas • Subsidiaries: Chiksan Export Company • Chiksan of Canada, Ltd.

#57-29

why this key compressor station works dependably despite these

temperature extremes

Compressor Station One is the key supply installation on the sprawling Pacific Northwest Pipeline system. Located at 6000 feet elevation near Ignacio, Colorado, the facilities boost pressure of nearly 300-million cubic feet of gas per day from the San Juan Basin gathering system. This station feeds a nearby gasoline plant before starting the gas on the long haul to the Pacific Northwest market.

In such a key spot, dependability is essential. Fish engineers carefully reviewed possible causes of trouble long before thoughts went into plans.

Extreme temperature fluctuations—from plus 100 degrees F. to minus 20 degrees F.—posed unusual problems. Under these conditions, reliable temperature control was difficult to achieve.

To be sure of providing efficient jacket water and lube oil temperatures under all extremes of ambient temperature and load, Fish designers elected to use unitized systems. Under this system, each engine has its own atmospheric cooler to take care of jacket water and lube oil cooling loads. A system of temperature control instruments was installed to provide very close control under all operating conditions. As designed, this remote station demonstrates extreme flexibility with reliability.

This is but one example of the type of advanced engineering you get from Fish. In addition, the same quality service prevails from feasibility study to project completion. If you are contemplating new or expanded facilities in oil, gas or chemicals, consult with Fish.

the fish companies

FISH ENGINEERING CORPORATION
FISH NORTHWEST CONSTRUCTORS, INC.
FISH SERVICE CORPORATION

Use **Humble's Thredkote 701** for maximum tool joint life

Thredkote 701 is a top-quality thread lubricant containing 60% pure metallic zinc. When the tool joint is madeup tight, this zinc is deposited on the threads in a thin film. As the string is run, this zinc film effectively guards against metal-to-metal contact and prevents galling.

Thredkote 701 gives the tool joint threads superior lubrication, so the joints will makeup easy and tight. It seals against high pressures, yet permits ready break-out.

Be sure to give new tool joint threads a careful and complete coat of Thredkote 701 for the first four or five trips that they make. New tool joints need this extra lubrication and protection because they resist makeup more than old ones, and their threads are more likely to gall.

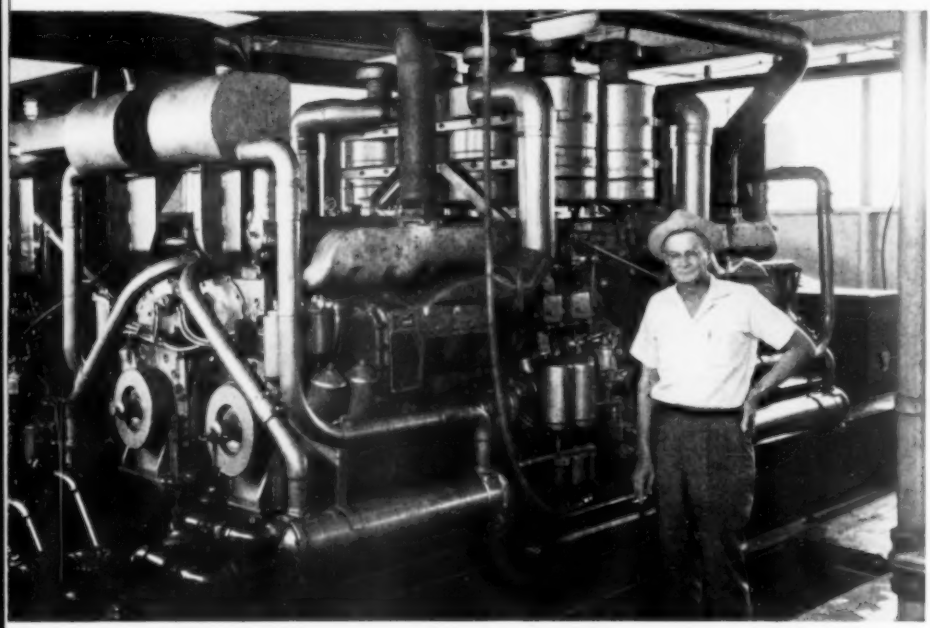
Thredkote 701 is one of a complete line of Humble thread compounds. There's one for almost every type of threaded connection. For more information on Thredkote, call your nearest Humble wholesale plant, or write or phone:

HUMBLE OIL & REFINING COMPANY

HUMBLE

Technical Service
Sales Department
Humble Oil & Refining Company
P. O. Box 2180
Houston 1, Texas

DEPENDABLE POWER



This is the Stewart & Stevenson GM Diesel 6-110 Quad and a man who knows his power — Joe E. Hellman, drilling superintendent for Glasscock Drilling Company

ECONOMY, LONG LIFE AND POWER—FROM 6-110 QUAD

What does a drilling superintendent look for in rig power? Ample power, of course . . . but economy of operation and long life, too. And these are the qualities found by the Glasscock Drilling Company on its Rig No. 14.

Joe E. Hellman, drilling superintendent for the company, says: "Glasscock now operates approximately 220 GM Diesel engines on drilling rigs and for other marine applications. Our company has standardized on GM Diesels because of their obvious economy, long life and good service rendered by Stewart & Stevenson Services, Inc."

On Glasscock Rig No. 14, a Stewart & Stevenson GM Diesel 6-110 Quad provides a 1000 H.P. wallop for the Gardner-Denver GP-GXR-H Mud Pump. There's power to spare.

The new 6-110 Quad develops 880 to 1000 continuous H.P., or up to 1200 intermittent H.P.

It couples POWER AND ECONOMY.

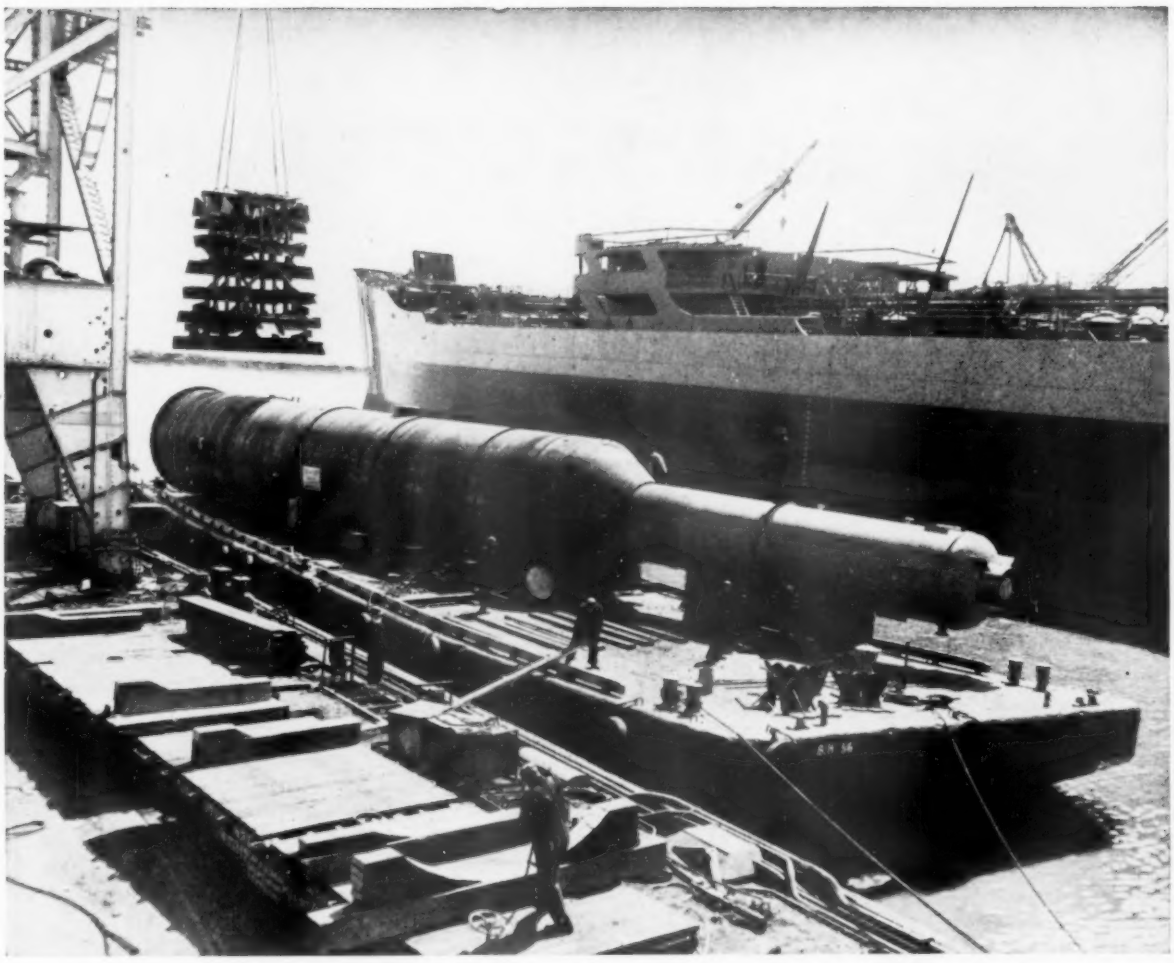
STEWART & STEVENSON

STEWART & STEVENSON SERVICES, Inc.

Main Office and Plant:	4516 Harrisburg Blvd., Houston 11, Texas Phone CApitol 5-5341
Branches:	Corpus Christi, Dallas, Lubbock, San Juan, Odessa
Representatives:	San Antonio, Longview, Brownsville, Tyler, Pecos, Beaumont
Export Office:	Room 1405, 74 Trinity Place, New York, N. Y.

We're proud of our record in meeting every power need for the nation's leading drilling contractors

THE WORLD'S LARGEST DISTRIBUTOR OF DIESEL ENGINES



standard procedure: VERSATILITY . . .

The variety of work which Sun Ship's integrated shops produce for use by industries on land and sea brings a matching variety of shipping problems.

Our facilities for tidewater shipment are used to economical advantage on many of the massive structures that go into the making of the nation's petroleum and chemical industries. The barge shipment of tower and shed row baffles, shown above, is a good example.

And of course—when shipment by land is necessary—Sun Ship rigging and routing find the ways and means to handle such items as large-diameter columns by rail and truck.

It's all a part of the versatility which forty years' experience has made part of "standard procedure" in service of its customers.

Our Sales Engineering Department would be glad to use its experience in helping you overcome any problem of construction or shipment that faces you. Write

Sun

SHIPBUILDING & DRY DOCK COMPANY

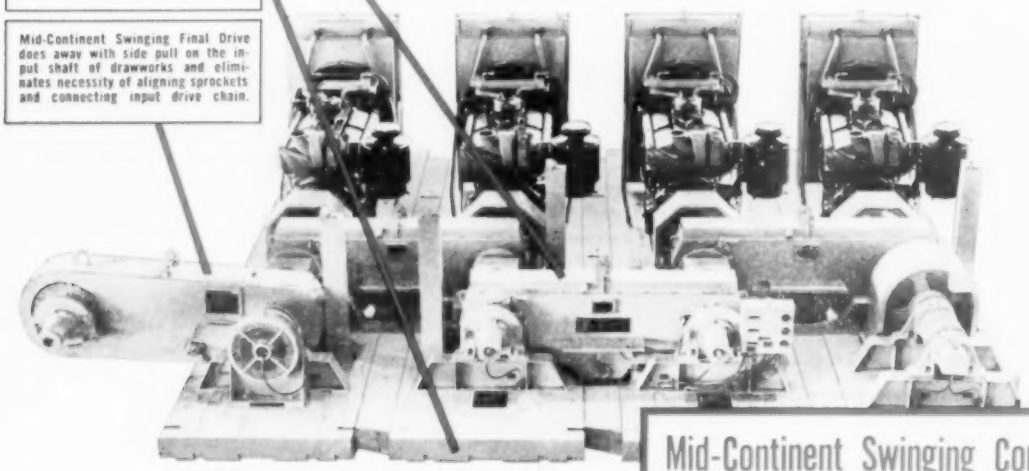
ON THE DELAWARE SINCE 1916 CHESTER, PA.

MID-CONTINENT
AE RIG DRIVE

Exclusive Swinging Compounds make moves possible without opening compound cases, draining oil, or "breaking" chains. Dust-proof, oil-tight compound cases are of heavy welded construction. Chains are lubricated from individual oil pumps.

Extra-heavy, four-runner skidded units are within eight-foot highway width limits and have dowel pin connections for perfect alignment.

Mid-Continent Swinging Final Drive does away with side pull on the input shaft of drawworks and eliminates necessity of aligning sprockets and connecting input drive chain.

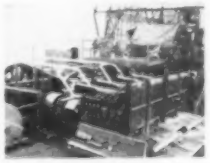


Compounds Swing
for easy moving...quick rig-up!

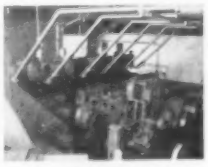
Designed for most any engine—drawworks combination, the Mid-Continent AE Rig Drive helps keep non-rotating time to a minimum. Exclusive *Swinging Compounds on all Mid-Continent AE Rig Drives simplify moves and rig-up. Within minutes, compounds can be swung from operating position to vertical locked position for moving, or from vertical to horizontal for drilling. Swinging Final Drive (input to drawworks), specified for many installations, adds still more to the versatility of this practical and dependable Rig Drive. See your Mid-Continent representative today about a Mid-Continent AE Rig Drive for your rig.**

*Patented

Mid-Continent Swinging Compound* Proved in 10 Years World-Wide Service



1947



1951

1955

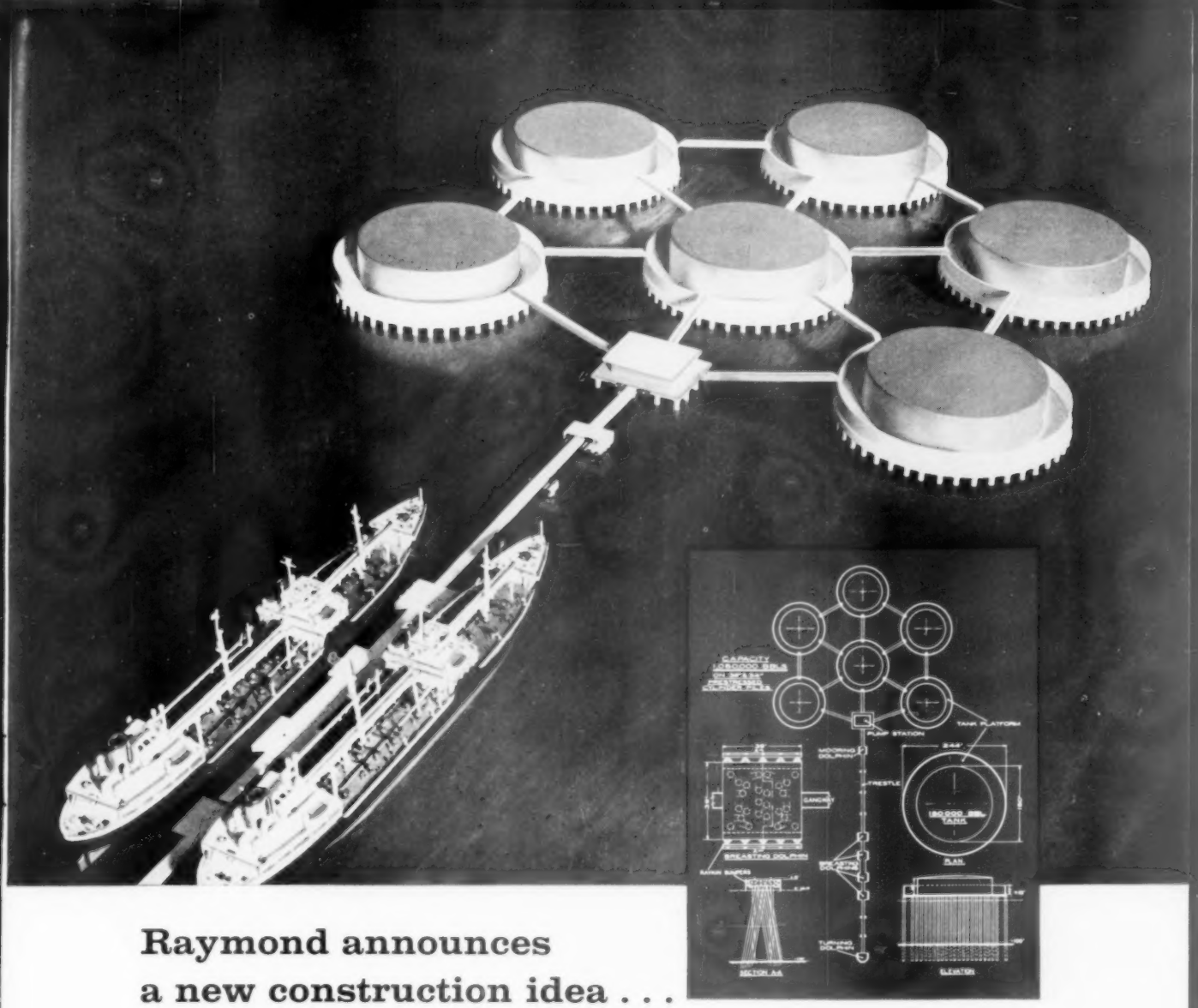
1957

In 10 years of world-wide service, the Mid-Continent Rig Drive has proved its superiority of design in practical multiple engine drive applications. More than 100 Mid-Continent Rig Drives have been specified by oil companies and drilling contractors for their world-wide drilling operations.

MID-CONTINENT SUPPLY COMPANY MID-CONTINENT BLDG. FORT WORTH, TEXAS

Export Division: 45 Rockefeller Plaza, New York 20, N. Y., Cable: MIDCUMPORT NYK

THE WORLD'S LARGEST INDEPENDENT OIL FIELD SUPPLY COMPANY



Raymond announces a new construction idea . . .

OFF-SHORE OIL STORAGE ISLANDS

Designed especially for oil companies engaged in off-shore drilling . . .

These bulk storage islands with direct-loading facilities will be of particular interest to oil companies at Lake Maracaibo as well as other expanding, off-shore oil producing regions. The most obvious advantage of these units is that they eliminate the congestion on shore caused by increasing bulk storage and tanker loading operations.

The unit shown consists of six, 180,000-barrel capacity steel tanks—providing a total capacity of 1,080,000 barrels—a pumping station, and mooring facilities accommodating up to two 100,000-ton tankers. The 130-foot wide, 40-foot high tanks rest on 244-foot prestressed platforms. The platforms, in turn, are supported by Raymond Prestressed Cylinder Piles, and all six platforms are connected by catwalks. This new, space saving design, just one of many feasible for this type of construction, exemplifies the degree of service Raymond offers its oil company clients. The development of new ideas, construction methods and materials is a continual process at Raymond. We will be glad to supply you further information on our oil storage islands.

RAYMOND CONCRETE PILE CO.

140 CEDAR STREET, NEW YORK 6, N. Y.
Branch Offices in the Principal Cities of the United States
Subsidiaries in Canada, Latin America and Other Countries

OUR 60TH YEAR • FOUNDATIONS FOR THE STRUCTURES OF AMERICA • COMPLETE CONSTRUCTION SERVICES ABROAD

REDUCE DOWN-TIME WITH THE BELL HELICOPTER

FORT WORTH, TEXAS

SUBSIDIARY
OF BELL AIRCRAFT
CORPORATION

BELL
Helicopter
CORPORATION

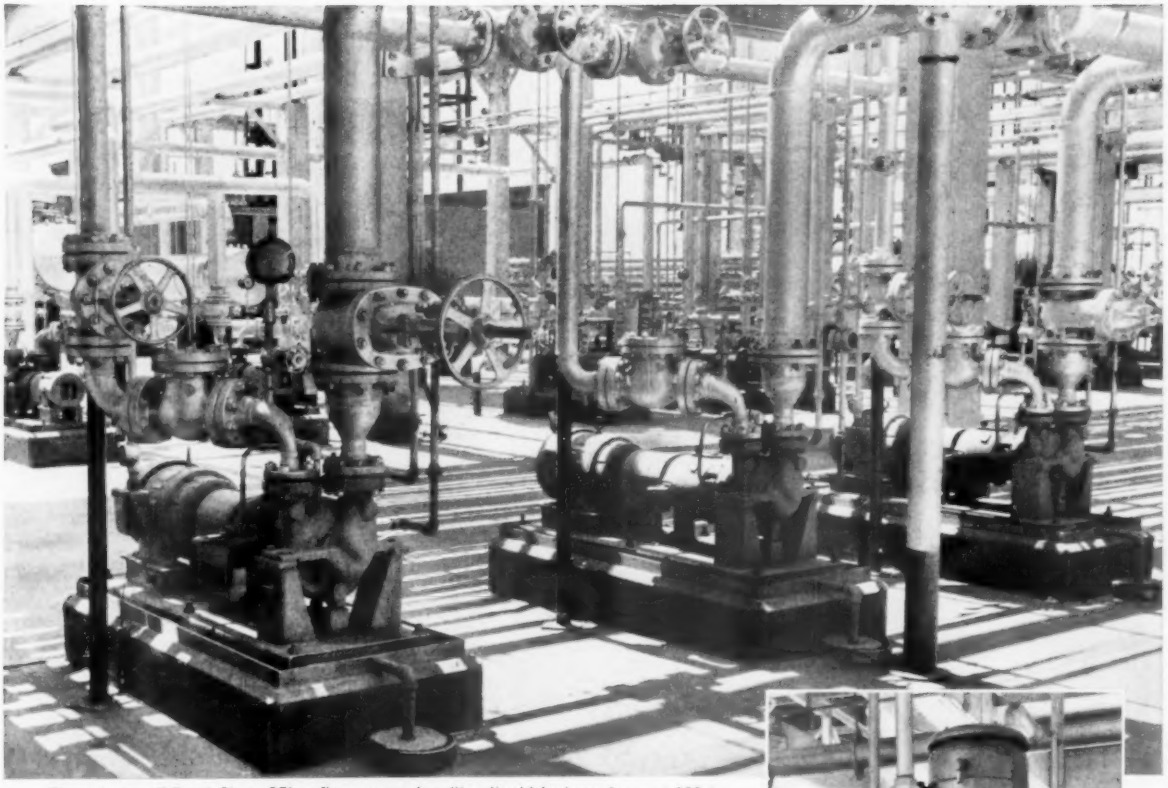
Ten years ago, down-time alone accounted for 10% of drilling time . . today, stepped-up efficiency has cut the figure in half. Outstanding among the oilman's cost-cutting tools has been the BELL HELICOPTER. Once thought of as a daring experiment, the Bell now *daily* proves its unique value in the operations of more than thirty oil companies.

Here are two recent cases that illustrate: • A company was paying $500 a day rental for a floating crane used in inaccessible bayou country. When it broke down, repair parts got there immediately by Bell, instead of the three days required by land. Result: a $1,500 saving. • Another company flew a complete engine to a breakdown site . . in six minutes . . by Bell. Distance by car, 70 miles.

There are many ways a Bell pays for its keep: by getting injured crewmen to a hospital quickly . . rushing troubleshooters to any site, in any weather . . bringing in parts and equipment on a moment's notice. (The Bell, with full fuel load, will carry up to 800 pounds of cargo . . either in its cabin or underneath.)

How much would it cost *you* to purchase a Bell . . to operate it? What about Charter service in your area? We can give you explicit cost information for your type of operation and will gladly explain the advantages of purchase or lease—or charter from your local operator. Why not write us today . . address Dept 45C, Bell Helicopter Corporation, Fort Worth, Texas.

Watch "WHIRLYBIRDS" *on TV . . consult your local paper for time and station.*



Three Ingersoll-Rand Class SFL reflux pumps handling liquid hydrocarbons at 100 to 110 gpm for new reforming unit at Cosden refinery.

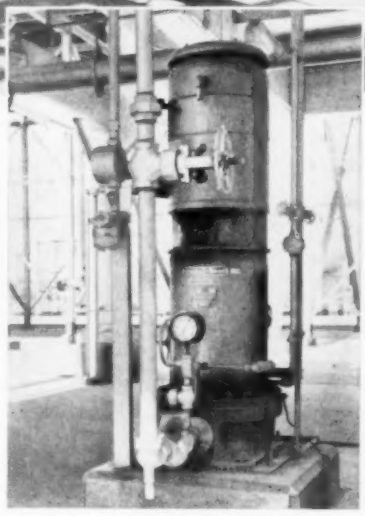
REFLUX PUMPS

at Cosden Rexformer Unit

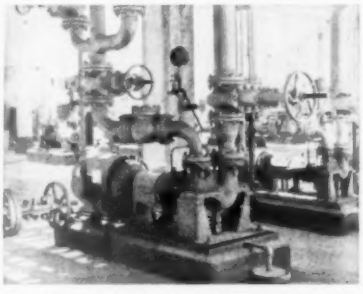
Ingersoll-Rand Centrifugals handle "vital fluids" for new Rexformer Unit at large Texas refinery

HERE AT the Big Spring Refinery of Cosden Petroleum Corporation, thirty Ingersoll-Rand centrifugals have the important job of pumping the "life blood" for the new U.O.P. designed Rexforming Unit. In addition to the reflux pumps shown here, other I-R pumps are in circulating, transfer and charge service — all performing functions vital to sustained operation of the reforming process.

Here at Cosden — as in major refining and processing plants all over the world — the dependability, efficiency and low maintenance of Ingersoll-Rand pumps contribute to the economy and trouble-free performance of the entire plant. For a *fast solution* to your pumping problems, just call your nearest I-R Branch Office.



Ingersoll-Rand 25-hp Class VP vertical extraction reflux pump handling hydrocarbon stock at 55 gpm.



Two Ingersoll-Rand Class MFL stripper column reflux pumps, each rated 390 gpm.

Ingersoll-Rand

10-691 11 Broadway, New York 4, N. Y.

PUMPS • COMPRESSORS • DIESEL ENGINES • AIR & ELECTRIC TOOLS • TURBO BLOWERS • CONDENSERS

Now DX Sunray has cut evaporation loss with Microballoon spheres for 3 years

Working storage tank at Cromwell, Okla., is pumping or receiving 80 per cent of the time, has a throughput of 2,500,000 bbl. per year. It handles select crude and mixed crude-casinghead gasoline. It is owned by Mid-Continent Pipe Line Co., subsidiary of D-X Sunray Oil Co.

This ad originally appeared in the December, 1956 issues of OIL & GAS JOURNAL and PETROLEUM WEEK

Still cutting evaporation loss after ~~two years~~

with Microballoon spheres*

Two years ago, D-X Sunray Oil Co. equipped this 35,000-bbl. cone-roofed tank with "Microballoon" spheres made from BAKELITE Brand Phenolic Resins. Since that time, this vapor-stopping blanket has reduced evaporation loss an estimated 70 to 80 per cent according to D-X Sunray.

Installing the spheres took eight men about three hours. Within 24 hours, the "Microballoon" spheres had formed a blanket spread over the entire oil surface. Today, this foam seal is still effective after some 5,000,000 bbl. of oil have been pumped through the tank.

These results indicate the economy and effectiveness of this method of evaporation control. To learn more about it, write today to Department XX-00.

*Registered trade-mark of The Standard Oil Co. (Ohio)

For evaporation control...
BAKELITE BRAND **RESINS**

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario.

The terms BAKELITE and UNION CARBIDE are registered trade-marks of UCC.

60-Second Summary / WHAT'S HAPPENING IN OIL

November 15, 1957

dept/INDEX

Production	33
Transportation	136
Processing	70
Marketing	166
Washington	30
Statistics	163
The Market Trend	164
Key Prices	165
Editorial	180
Economics	96
International	146
Letters	92
Management	154
Oil Men at Work	128
Personals	174
Petroleum Comments	69
Service & Equipment	178
Special Report	99

Rumors of a possible cut in crude postings plagued producers at the API meeting in Chicago. Worry is that a price tumble may come after the start of the year. . . . p. 23

•

The No. 1 problem facing the entire oil industry is how to cut costs. It becomes more important—and more difficult—as the growth in demand slows down. . . . p. 26

•

Standardization of equipment is the economic and engineering answer to reducing drilling and production costs, according to F. M. Mayer of Continental-Emsco Co. . . . p. 38

•

Failure of the voluntary imports plan could lead to direct federal regulation of the oil industry. That's the warning given at the API meeting by Matthew V. Carson and Ernest O. Thompson. . . . p. 36

•

A new squabble may be brewing between independents and majors over crude markets. The independents want pipeline connections so they can get a share of the market. They may even join the U. S. in possible suits against pipelines. . . . p. 23

•

The Justice Dept. might drop its "cartel" charges against majors if they will stop joint marketing abroad. In exchange, the U. S. appears willing to approve existing joint producing, refining, and transportation operations. . . . p. 69

•

Processing with nuclear radiation is coming close to reality. A Petroleum Week special report highlights the gains being made by 14 companies in harnessing nuclear energy to process operations. . . . p. 99

•

A continuous process has been developed to make cat poly gasoline. The new California Research technique uses a liquid catalyst. . . . p. 70

•

Helping college men to do graduate work is aid well spent. An Ethyl Corp. survey shows that students who get fellowships advance further in industry careers. . . . p. 154

•

Barge operators hope to recapture business lost to pipelines with long-term contracts and specialty hauling. They're also improving efficiency to lower costs. . . . p. 136

•

Motor tuneups at service stations grow in popularity, despite some dealer opposition. It's one way of boosting revenues. . . . p. 166

Up to the Minute

SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

November 15, 1957

President Eisenhower still thinks the Texas offshore boundary is 10.5 mi., despite a federal suit to set it at 3 mi. (page 28). He has expressed this view to Texas Gov. Price Daniel, who says that Herbert Brownell filed the suit on his final day as attorney general "to keep his political record in good shape."

•

API will merge its Oil Information and American Petroleum Industries committees, as predicted by Petroleum Week (PW—Oct.11'57,p15). Consolidation "at the earliest practical date" was approved by the API board of directors this week. Details will be worked out by a directors' committee, and probably will be presented at the executive committee meeting next February. The ultimate plan calls for a Public Affairs Committee, composed of oil executives, to report to the API board.

Pending consolidation, API directors voted a tentative OIC budget of slightly less than $3-million, a small cut from the 1957 figure.

•

The National Congress of Petroleum Retailers is organizing a nationwide campaign to put over S. 11 when Congress reconvenes. NCPR President Cash Hawley predicts an early showdown, probably in January. Meeting in Chicago this week, the organization's board of directors created a 250-man committee from 38 states to build grass-roots support. Thus far, proponents have been unable to get S. 11 cleared by the Senate Judiciary Committee.

•

Independent producers are putting new heat on the military's oil-purchasing policies. Russell B. Brown, IPAA general counsel, wrote Defense Secretary Neil McElroy this week that military oil buyers are flouting the clear intention of the Buy America Act, which provides for preference to U.S. suppliers.

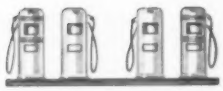
Pentagon officials are considering holding military purchases of foreign oil products to 10% or 15% to conform with the government's crude imports restriction plan. The decision may be left up to the President's Cabinet Committee on Imports.

•

Another "reluctant" importer has fallen into line with the government's program to hold down imports of crude. Matthew V. Carson, imports boss, told the API meeting that Standard Oil Co. (Ohio) has now assured him it will adhere to the program through next June. Earlier, Sohio had committed itself to cooperation only through Jan. 1. Carson hailed Sohio's move as "highly laudable."

•

Sun Oil Co., however, is standing fast. Ted C. Stauffer, Sun's director of foreign operations, said in Dallas this week that Sun's Marcus Hook (Pa.) refinery could not survive if it had to operate primarily on domestic crude. "Competitive factors would not allow it," Stauffer said.



MOTORISTS GET ALL THE POWER THEY PAY FOR WHEN GASOLINE CONTAINS

Tenamene

EASTMAN GASOLINE ADDITIVES

The formation of gums can play havoc with the performance you've so carefully built into your gasoline. Play havoc with sales, too. Let Tenamene gum inhibitors solve this problem for you—Eastman's highly qualified petroleum specialists will be glad to visit your refinery and recommend the proper additive for your needs.

For more information on Tenamene additives and the service that backs up their proper use, contact our local representative or write to EASTMAN CHEMICAL PRODUCTS, INC., *subsidiary of Eastman Kodak Company,* KINGSPORT, TENNESSEE.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

Only the BAKER Packer does so many jobs so well !

BAKER
OIL TOOLS, INC.
HOUSTON
LOS ANGELES
NEW YORK

PRODUCTION APPLICATIONS

SINGLE ZONE Normal Completion

SINGLE ZONE Permanent Type Well Completions

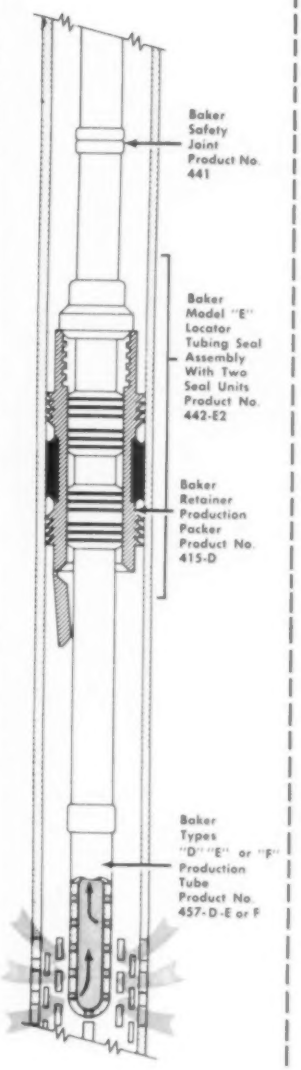
Baker Retainer Production Packer Product No. 415-D

FEATURES

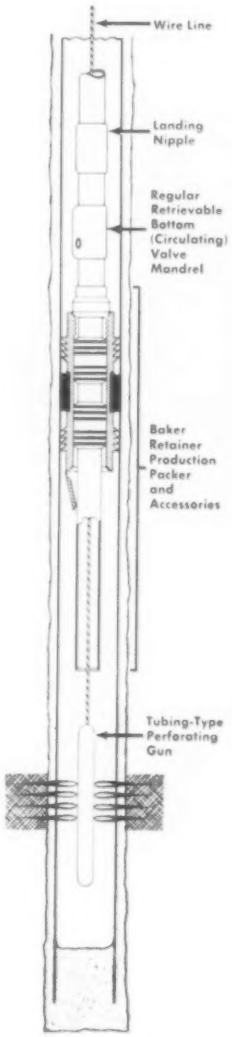
Holds any pressure from either above or below that is safe for the casing, even under temperatures in excess of 300°F.

Pack-off is independent of set-down weight or tension. Tubing string is free; just pick up (or unlatch and pick up) to remove it.

Use it as a squeeze and testing tool or as a temporary or permanent bridge plug in conjunction with any production application.

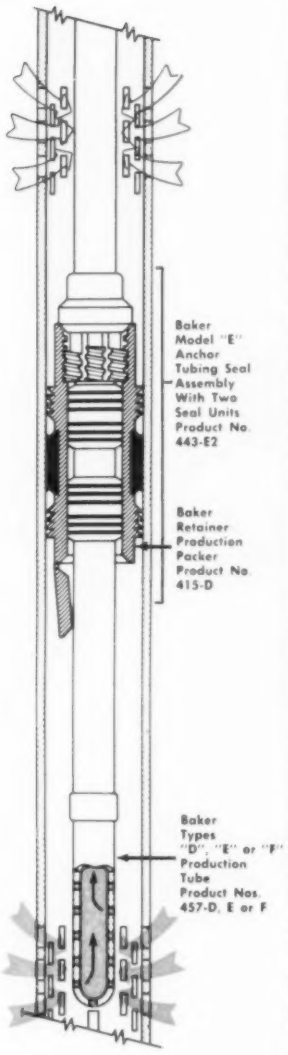

Baker Safety Joint Product No. 441
Baker Model "E" Locator Tubing Seal Assembly With Two Seal Units Product No. 442-E2
Baker Retainer Production Packer Product No. 415-D
Baker Types "D" "E" or "F" Production Tube Product No. 457-D-E or F

Illustrates Packer set in casing with Locator Tubing Seal Assembly and Production Tube installed for single-zone production.



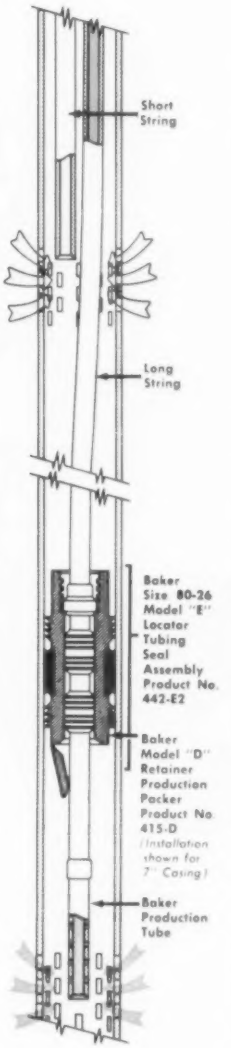
Illustrates typical Permanent-Type Well Completion Hook-Up showing perforating operation through and below the Packer.

DUAL ZONE
Normal Completion


Baker Model "E" Anchor Tubing Seal Assembly With Two Seal Units Product No. 443-E2
Baker Retainer Production Packer Product No. 415-D
Baker Types "D", "E" or "F" Production Tube Product Nos. 457-D, E or F

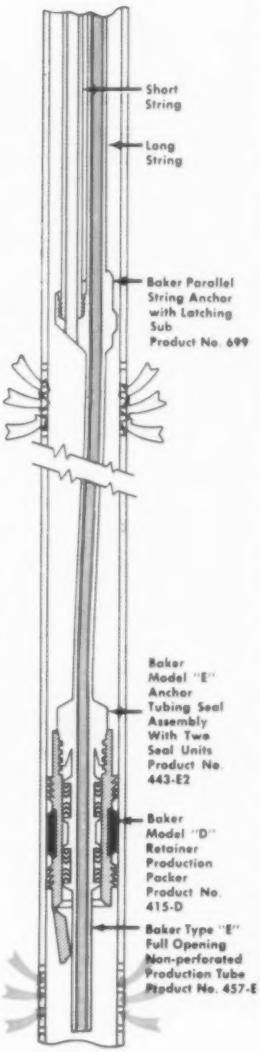
Illustrates Packer set in casing, with anchored production string for dual-zone production. Tubing can be released from Packer by rotating to right.

DUAL ZONE
Parallel String
Short String
Hanging Free


Short String
Long String
Baker Size 80-26 Model "E" Locator Tubing Seal Assembly Product No. 442-E2
Baker Model "D" Retainer Production Packer Product No. 415-D (Installation shown for 7" Casing)
Baker Production Tube

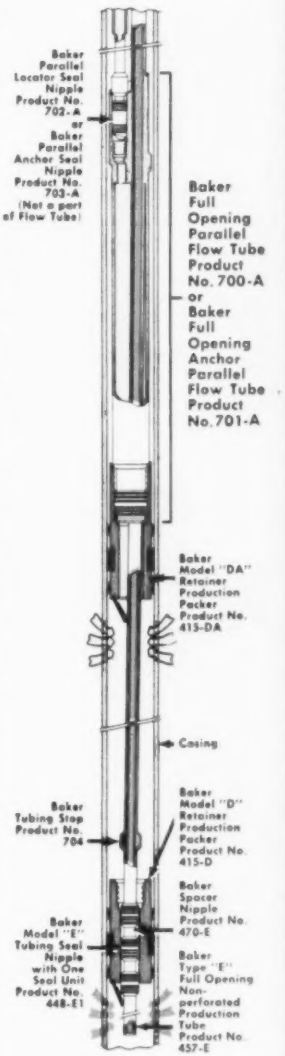
Permits removal of either string independently of the other regardless of sequence. Full-Opening (Tubing I.D.) Long String to lower zone.

DUAL ZONE
Parallel String
Short String
Anchored

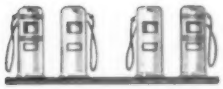

Short String
Long String
Baker Parallel String Anchor with Latching Sub Product No. 699
Baker Model "E" Anchor Tubing Seal Assembly With Two Seal Units Product No. 443-E2
Baker Model "D" Retainer Production Packer Product No. 415-D
Baker Type "E" Full Opening Non-perforated Production Tube Product No. 457-E

Permits removal of either string independently of the other, however long string must be run first. Short string pulled first. Full-Opening (Tubing I.D.) Long String.

DUAL ZONE
Parallel String
Two-Packer Hook-up


Baker Parallel Locator Seal Nipple Product No. 702-A or Baker Parallel Anchor Seal Nipple Product No. 703-A (Not a part of Flow Tube)
Baker Full Opening Parallel Flow Tube Product No. 700-A or Baker Full Opening Anchor Parallel Flow Tube Product No. 701-A
Baker Model "DA" Retainer Production Packer Product No. 413-DA
Casing
Baker Tubing Stop Product No. 704
Baker Model "D" Retainer Production Packer Product No. 415-D
Baker Spacer Nipple Product No. 470-E
Baker Model "E" Tubing Seal Nipple with One Seal Unit Product No. 448-E1
Baker Type "E" Full Opening Non-perforated Production Tube Product No. 457-E

Illustrates Two-Packer parallel string installation with each zone confined to its individual tubing string with full-opening to lower zone for use of all permanent-type completion tools.



MOTORISTS GET ALL THE POWER THEY PAY FOR WHEN GASOLINE CONTAINS

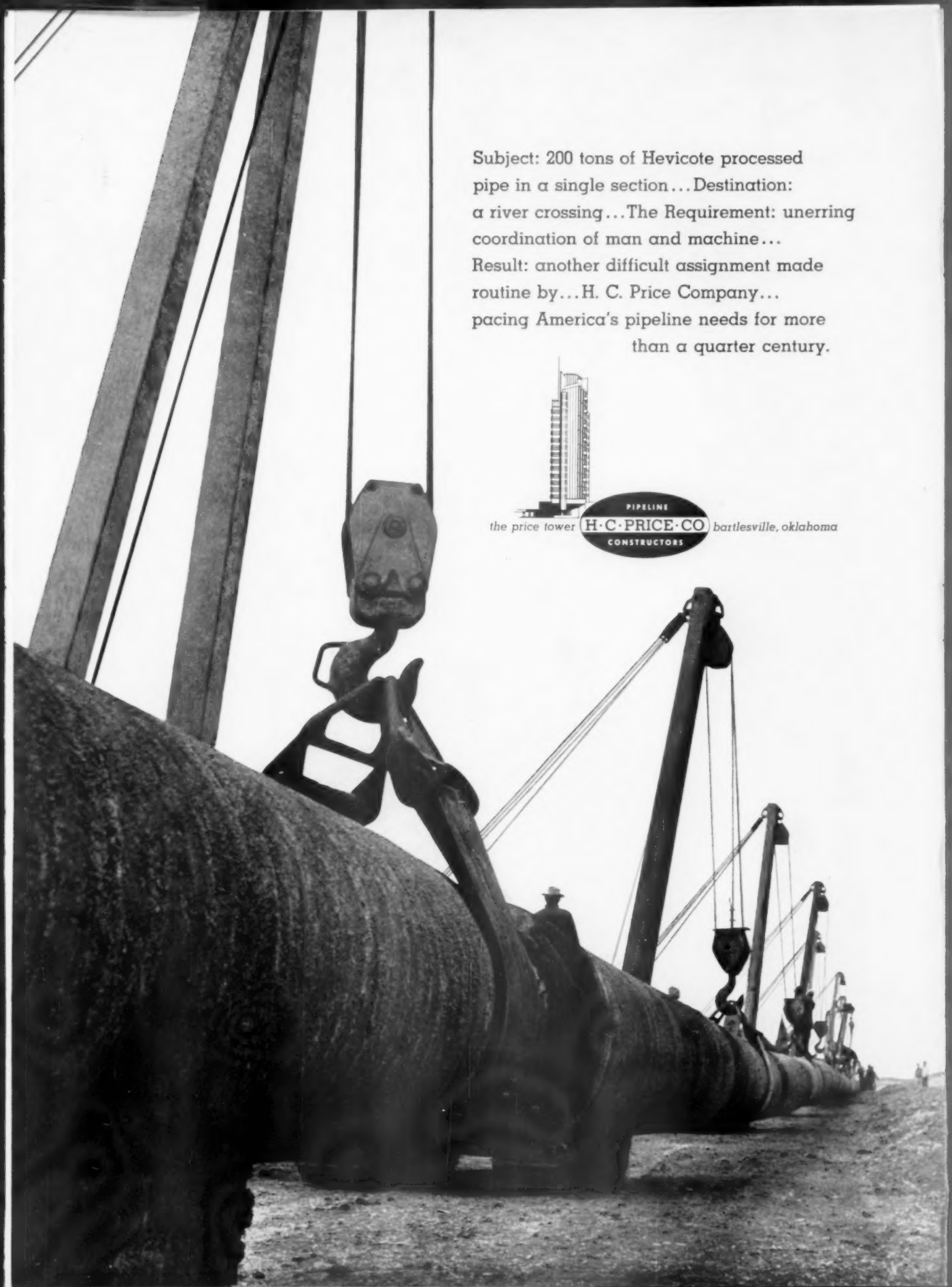
Tenamene

EASTMAN GASOLINE ADDITIVES

The formation of gums can play havoc with the performance you've so carefully built into your gasoline. Play havoc with sales, too. Let Tenamene gum inhibitors solve this problem for you—Eastman's highly qualified petroleum specialists will be glad to visit your refinery and recommend the proper additive for your needs.

For more information on Tenamene additives and the service that backs up their proper use, contact our local representative or write to EASTMAN CHEMICAL PRODUCTS, INC., *subsidiary of Eastman Kodak Company,* KINGSPORT, TENNESSEE.

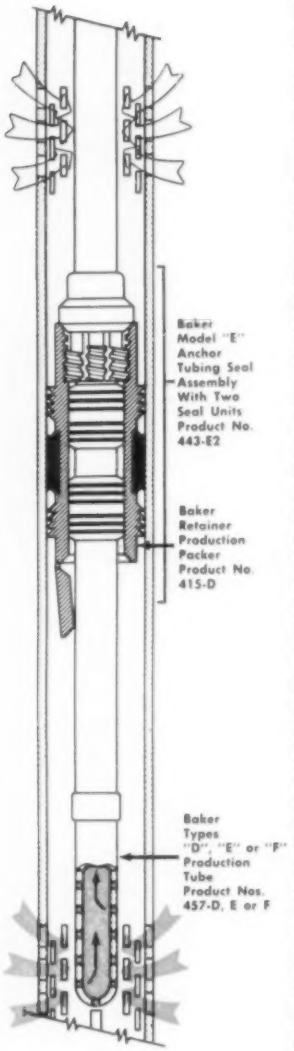
SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.



Subject: 200 tons of Hevicote processed
pipe in a single section... Destination:
a river crossing... The Requirement: unerring
coordination of man and machine...
Result: another difficult assignment made
routine by... H. C. Price Company...
pacing America's pipeline needs for more
than a quarter century.

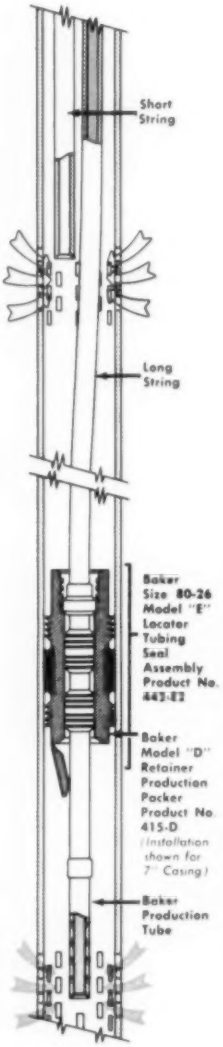
the price tower H·C·PRICE·CO PIPELINE CONSTRUCTORS bartlesville, oklahoma

DUAL ZONE
Normal Completion


Baker Model "E" Anchor Tubing Seal Assembly With Two Seal Units Product No. 443-E2
Baker Retainer Production Packer Product No. 415-D
Baker Types "D", "E" or "F" Production Tube Product Nos. 457-D, E or F

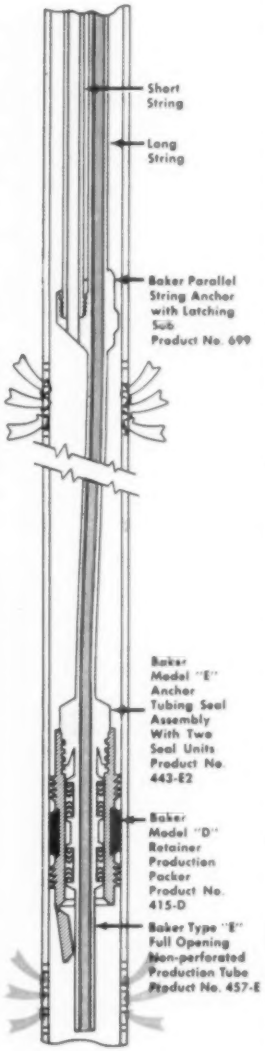
Illustrates Packer set in casing, with anchored production string for dual-zone production. Tubing can be released from Packer by rotating to right.

DUAL ZONE
Parallel String
Short String
Hanging Free


Short String
Long String
Baker Size 80-26 Model "E" Locator Tubing Seal Assembly Product No. 443-E2
Baker Model "D" Retainer Production Packer Product No. 415-D (Installation shown for 7" Casing)
Baker Production Tube

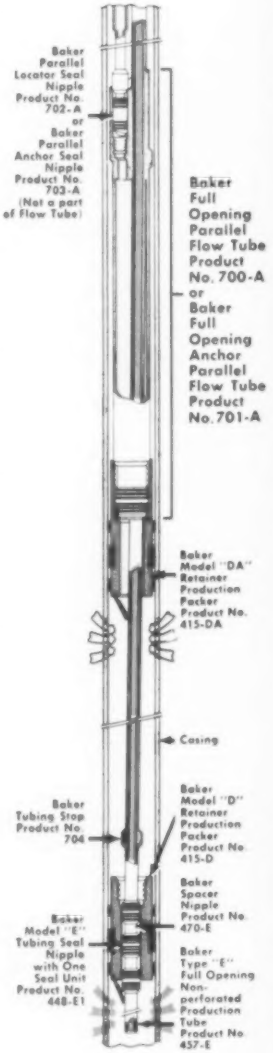
Permits removal of either string independently of the other regardless of sequence. Full-Opening (Tubing I.D.) Long String to lower zone.

DUAL ZONE
Parallel String
Short String
Anchored


Short String
Long String
Baker Parallel String Anchor with Latching Sub Product No. 699
Baker Model "E" Anchor Tubing Seal Assembly With Two Seal Units Product No. 443-E2
Baker Model "D" Retainer Production Packer Product No. 415-D
Baker Type "E" Full Opening Non-perforated Production Tube Product No. 457-E

Permits removal of either string independently of the other, however long string must be run first. Short string pulled first. Full-Opening (Tubing I.D.) Long String.

DUAL ZONE
Parallel String
Two-Packer Hook-up


Baker Parallel Locator Seal Nipple Product No. 702-A or Baker Parallel Anchor Seal Nipple Product No. 703-A (Not a part of Flow Tube)
Baker Full Opening Parallel Flow Tube Product No. 700-A or Baker Full Opening Anchor Parallel Flow Tube Product No. 701-A
Baker Model "DA" Retainer Production Packer Product No. 415-DA
Casing
Baker Tubing Stop Product No. 704
Baker Model "D" Retainer Production Packer Product No. 415-D
Baker Spacer Nipple Product No. 470-E
Baker Model "E" Tubing Seal Nipple with One Seal Unit Product No. 448-E1
Baker Type "E" Full Opening Non-perforated Production Tube Product No. 457-E

Illustrates Two-Packer parallel string installation with each zone confined to its individual tubing string with full-opening to lower zone for use of all permanent-type completion tools.

What Do 'Consent' Suits Mean?

A new intra-industry squabble may be one result of the Justice Dept.'s investigation of pipelines—because the real issue behind the new study is independent producers' fight for pipeline outlets.

The squabble had its origins in Texas last spring when leading producer associations appealed to the Texas Railroad Commission to force common-carrier crude lines to provide outlets for approximately 8,000 unconnected wells, primarily in the West and North Central districts.

The producers generally charged that six major crude buyers in Texas, which, through affiliates, controlled the major pipeline systems, had a "strangle hold" on the market. Oil produced by independents, the producers charged, was denied markets because of the lack of connections, while the major buyers increased imports.

Some of the major buyers themselves have unconnected wells in Texas. And some of them—or their pipeline affiliates—presented testimony to show that to connect to many of the wells would be uneconomical.

The independents are after a share of the market—no matter how small. And they are threatening to join the Justice Dept. in the possible antitrust suits that may stem from the current investigations.

The independents have carried their case to congressional committees. Lester Clark, representing some Texas producer groups, testified that the major companies, "our principal competitors, [have] sole control over our markets—which they can open or shut at their own discretion, obliging their own interests."

The Justice Dept. has a two-pronged attack against pipelines: (1) The investigation now under way is looking into "monopolistic practices; and (2) the department already has charged four pipelines with violating the Elkins Act consent decree, and says that more are coming.

The current investigation covers all crude and product pipelines owned by major oil companies; it aims to "detect any anticompetitive aspects of joint ownership" (PW—Oct.25'57,p11).

The Justice Dept. has said that it is worried by the antitrust implications of major company "control" over oil transportation in the U.S. And, specifically, Justice attorneys say they are worried over purchaser proration and unconnected wells.

Whether or not the antitrust suits are filed, the proceedings on the Elkins Act consent decrees alone will be enough to give the pipelines and their major-company owners headaches.

The four motions on the consent decree issue that have been filed in the U.S. District Court at Washington alleged violations by Arapahoe Pipe Line Co. (Pure and Sinclair), Service Pipe Line Co. (Indiana Standard), Tidal Pipe Line Co. (Tidewater Oil Co.), and Texas Pipe Line Co. (Texaco).

The Justice Dept. charges that some pipeline companies are paying illegal dividends to their owner oil companies. The Elkins Act consent decree limits such payments to 7% of valuation.

The Elkins Act consent decree grew out of suits filed by the Justice Dept. in 1940 against Phillips Petroleum Co., Great Lakes Pipe Line Co., and Standard of Indiana, seeking treble damages on the ground that dividends received by the defendants as shipper-owners of pipelines constituted unlawful tariff rebates under the Elkins Act.

The act, passed in 1903 and later amended, was designed to strengthen the antirebate provisions of the Interstate Commerce Act.

Most of the industry lawyers felt that the government's rebate claim was a legal fantasy, according to one attorney who was involved in the wrangle at the time. That attorney was Charles I. Thompson, who represented Atlantic Refining Co. in the Mother Hubbard suits that were filed at about the same time as the Elkins Act suits. He told the House Antitrust subcommittee (Celler committee) last month that Justice attorneys in early 1941 argued that the act prohibited shipper-owners from receiving any dividends from pipeline affiliates.

Some pipelines and their shipper-owners fear that the government's latest consent-decree suits may be aimed at divorcement of pipelines from integrated companies.

It was "common knowledge" in the industry, Thompson told the Celler committee, that Justice had included a petition for divorcement in its complaint in 1940. But the President's Defense Council, reviewing the com-

Will Crude Prices Drop?

A persistent rumor overclouding the API meeting in Chicago this week is that crude prices may tumble after the first of the year.

General crude postings, some buyers say, have continued "artificially high" in face of the oversupply that has plagued the industry since late spring.

And even though there has been some improvement in the excessive inventory position (page 163), some large buyers insist that postings are too high.

"Unless crude demand takes a sudden sharp upturn soon," one buyer commented, "postings are going to skid in January." Another major purchaser said he was "surprised" that general postings have been maintained so far.

And while buyers say that all gravities will be hit with lower postings, they also talk of price penalties for higher-gravity crudes.

Indications now are that the possible new posting schedules will impose price penalties on crudes over 44-gravity—like those now applied to below-20-gravity oils.

Buyers also hint that they may break away from the historic 2¢-a-bbl. price differential on gravity schedules. It could be, one suggested, that future schedules may show 6¢ and 7¢ differentials.

plaint prior to filing, decided that divorcement would be inconsistent with national defense planning, Thompson said.

The consent decree that came out of the 1940 suits against the pipeline companies and their shipper-owners was considered to be a hastily drawn document—necessitated by the outbreak of World War II.

The decree came about after the appointment of Harold L. Ickes, then Secretary of Interior, as Petroleum Coordinator for National Defense.

In mid-1941, Ickes argued that the war in Europe would result in a petroleum product shortage on the East Coast.

Among other solutions to the possible shortage, Ickes advocated a Texas-to-East Coast crude pipeline. He wanted a group of major companies to build and operate such a line, based upon a complete amortization of costs within a five-year period.

The Ickes proposal required a concerted cooperation by the companies which, attorneys felt, was entirely inconsistent with the tentative consent decree being drawn in the Mother Hubbard case.

As Thompson told the House subcommittee: "From the point of view of the industry, one branch of the government was calling on it to combine and engage in concerted activities to aid national defense. Another, the Antitrust Division, was seeking a decree to enjoin all such combinations and concerted activities."

After protracted wrangling during the summer and fall of 1941, the Japanese attack on Pearl Harbor led to the adoption of the Elkins Act consent decree on Dec. 23, 1941.

The 7% limitation on "dividends . . . and other valuable considerations" that can be paid by pipelines to their shipper-owners was a forced compromise. Top Justice Dept. officials admitted that the decree had many imperfections.

The decree contains vague definitions of valuations and "sums of money and other valuable considerations" subject to the 7% limit.

Because of such loose wording, problems arise on:

- Whether repayment of loans by pipelines to their owners in addition to dividends constituted a violation of the 7% limitation.
- Whether payments can be made by pipelines to owners for legal, engineering, and other services performed by the parent.
- Whether savings made by joint purchases of materials by parents for pipeline affiliates constitute illegal payments.

LOBBYING FOR A ROOM, these arrivals chat in line. Left to right, G. A. Burns, retired president of Butler Mfg. Co.; Warner Lewis, Warner Lewis Co. chairman; Cornelius Dwyer, consultant; and W. O. Kupper, Jones & Laughlin.

Scene at Chicago: Mixing B

SIGNING IN at the API registration desk are Maynard Taxman, Advance Refining, Centralia, Ill., and Hymie Milder, Milder Oil Co., Omaha, Neb.

COMMITTEE MEETINGS are the backbone of API work. This is the Refining division's executive committee. The chairman: J. C. Ducommon, Indiana Standard.

A QUICK VISIT by Reid Brazell, left, Leonard Refineries, with D. L. Anderson and A. M. Schrepfer, Vickers.

BIG HELLO: C. J. Berlin, Baker Oil Tools; L. D. (Red) Webster, Lone Star Steel, and Frank Loe, Magcobar.

ALL SET: D. E. Sullivan, left, Pure Oil Co., and C. F. Gearhart, Standard Oil Co. (Ind.).

Business and Pleasure at Annual API

INFORMATION, PLEASE: Dick Stickel, White Motor Co. executive vice-president, signs an API registration card.

CORRIDOR CONFAB: W. C. Whaley, left, Sunray Mid-Continent president, and A. W. Thompson, Thompson Drilling Co., Houston.

IDEA EXCHANGE between Sunday meetings by R. A. Brannon, left, Humble Pipeline Co., and L. C. Davidson, Cities Service Oil Co.

LOOKING 'EM UP on registration board are Dennis Youngblood and Theron Batchelder, Patterson Oil Co.

What's Worrying Oil Men? Ways of

When Petroleum Week asked oil men across the nation to list their worries last week, the one named most frequently was: How to cut costs.

Many other problems were listed, of course: Imports, oversupply prices, lower profit margins, government controls, and public opinion. But it was clear that the matter of cost is rapidly becoming the biggest worry of them all.

Costs are always important, but the degree of importance varies with conditions. When demand is strong and supply is weak, for example, rising costs can be offset—at least in part—by passing the higher cost along or by stepping up output.

That, to a considerable extent, has been the situation for the oil industry and others through most of the post-war era.

But when supply becomes strong and demand softens, costs are hard to offset. Price hikes are difficult, if not impossible. And increased output would only hurt, not help.

That is the spot most oil men find themselves on now. And the situation may get worse before it gets better, unless some unexpected emergency crops up to boost demand substantially.

More and more attention is being given to cost-cutting, because that appears to be just about the only avenue of escape from falling profit margins.

A Texas producer, for instance, knows he can do nothing about crude prices. And there is nothing he can do about allowables. So about all that's left is for him to consider how he can whittle his costs down.

And a refiner, caught between high inventory and faltering product-price levels, sees nowhere to turn except to try to increase efficiency.

The same is true of the marketer. Faced with price wars and a leveling off of volume, he has to sharpen his pencil in figuring costs.

I. How Producers See It

Although many drilling contractors and producers still list imports as the biggest threat, they almost inevitably get around to talking about costs.

A vice-president of an Oklahoma producing firm made this typical comment: "One of our top problems is how we can keep costs down. Our lifting costs are constantly increasing. We must find more efficient and cheaper ways to find and produce our domestic oil if we are to continue to make a normal profit."

His company feels that automatic custody transfer (ACT) is a partial answer to the problem. But he notes that such systems are limited to particular fields where they can be applied economically to pay out.

A production engineer operating in the Mid-Continent area says his company is trying to trim operating costs through modernization of its field facilities. It is moving toward electrification wherever possible, and is concentrating on a continuous maintenance plan to help keep costs down.

An official of a West Coast firm with production in California and Texas thinks an aggressive attack on costs would help minimize the imports problem by making domestic oil more competitive.

"We need a new exploration tool that will enable us to find oil more cheaply," he says. "There is a need for low-cost, information-type drilling. The present slimhole rigs aren't quite the answer.

"If somebody could develop something to drill without using drill-pipe—maybe something like a hose outfit mounted on a half-track so one man could drill a 5,000-ft. hole, log it, and move on—we could find the stratigraphic traps."

Imports, oversupply, and threats of renewed attacks on the depletion provision also cause producers to lose sleep.

Although there appears to be growing satisfaction with the progress of the government's "voluntary" program for restricting imports, that problem still casts a long shadow.

One firm's vice-president of production put it this strongly:

"Imports, by far, are the biggest problem facing the industry today.

"If things are allowed to continue as they have been heading, the independent driller is going to be out of business. And if that happens, the industry is going to be hit with one of the biggest shakeups in its history."

Many of those interviewed, however, feel that beneficial effects of the voluntary program will show up increasingly in the months ahead.

Regarding the depletion provision, one company spokesman points out that the continued threat of reduction of the depletion provision "has scared a lot of investment money out of the picture."

Other worries getting frequent mention by those interviewed include:

- "Too many rigs and too much oil"—Jack Abernathy, past president of the American Association of Oilwell Drilling Contractors.
- "The lack of discoveries off the Texas coast"—a Texas offshore operator.
- "A shortage of good technical people"—a Texas operator.
- "We aren't finding any new fields"—a California drilling company official.
- "We lack economic places to drill"—a major company production official.
- "The high price of borrowed money"—a West Coast producer.

Perhaps a Rocky Mountains drilling contractor summed up the over-all situation best with this remark: "Money can still be made, but the competition is fierce."

II. Processors' Views

The processing segment of the industry shares some of the general worries. But it has some special ones of its own, too.

Oversupply is the biggest problem, with the squeeze between crude prices and soft market prices running a close second.

One independent refiner thinks that perhaps the current tight money situation may be of help.

"I'm in favor of tight money if it will slow down overproduction in all segments of the industry, and restore our economic picture to a more balanced position," he says.

An independent refiner in North Dakota thinks there may be a break in crude prices, thereby easing the cost squeeze on refiners.

A Midwest refiner fears that, if a proposed products line is built from the East Coast to the Chicago area, refiners there will be hurt because they will be competing with products made from cheaper foreign crude.

Cutting Cost Now Ranks as No. 1

The "special" worries of refiners include changing fuel requirements, a continued octane race, and keeping abreast of technical process improvements to avoid obsolescence.

A large independent refiner in the Mid-Continent area puts at the top of his list decisions on what new processes should be used to assure product quality to meet future competition.

"We are worried about what motor-fuel requirements will be over the next several years. These include octane numbers, performance demands, development of fuels to give longer engine life, freedom from vapor lock, quick starting, etc.

"We want to know how best to modify or add to our equipment to give the public what it wants and needs," he said.

Another refinery official notes that his firm is seeking some built-in flexibility.

"We are now building a platforming unit, a butane isomerization unit, and an HF alkylation unit. With all three, we would have a pretty good chance of being prepared for whatever comes," he said.

Some refiners are uncertain about how far they should go into petrochemicals.

"We believe that companies with a wide research background will be the ones that will be successful in petrochemicals," one refiner said, "because they will come up with something 'new' to sell the public."

He fears that some refiners are being "pushed" into petrochemicals without being prepared. "Just getting into petrochemicals to make something somebody else is making is not the answer," he said.

III. Marketers Worry

Most of the marketer's problems are old ones, but age doesn't lessen their impact.

These were some typical comments:

- "The biggest problem I have is keeping the jobbers happy in spite of the competition we face from the unbranded suppliers, who have made giant inroads here [Chicago]."
- "The outlandish price of real estate."
- "My problem stems from over-production, especially in light oils and middle distillates . . ."
- ". . . getting capital . . ."
- "Lack of trained dealers."
- "The freeway challenge. No book has been written yet to tell you where to put stations when you come to a freeway."

Marketers frequently mentioned public relations as one of the industry's top problems.

This may stem from the fact that the marketer is close to the general public and more aware of and sensitive to public reactions.

IV. So Does Washington

Oil men in Washington are worried about the natural gas bill, the oil imports controversy, danger to percentage depletion, and antitrust attacks.

It's hard to find an oil man in Washington these days who thinks the proposed gas bill will pass next year.

Rep. Oren Harris (D., Ark.), sponsor of the bill, has sent word along that the bill can't pass in the face of outright opposition from the coal industry.

On the other hand, it is equally obvious the bill can't pass in the face of opposition from the interstate pipelines.

And the pipelines are at odds with the coal industry over the latter's demand that direct industrial gas sales by the pipelines be banned.

To make matters worse, the spate of antitrust and price-discrimination actions against the oil industry gives the opposition more ammunition, for it makes it more dangerous politically for a "neutral" lawmaker to vote with the oil industry.

On imports, oil men in Washington are now more optimistic than they have been in months.

When the President first announced the new voluntary program last summer, spokesmen for both domestic producers and importers were inclined to be pessimistic about the plan's chances of success.

Developments since that time have been a pleasant surprise, however. The government has taken a firm position, and almost all importers have fallen in line.

Although the more vocal independents are still demanding new legislation, it is doubtful in cold political terms that mandatory controls can be voted for oil imports—as long as the voluntary program works reasonably well.

Oil observers in Washington are divided over the degree of danger to percentage depletion.

The 27.5% oil and gas depletion provision comes under attack in Congress almost every year. These attacks usually don't pose much of a threat. But there are now some new factors to be considered.

Opponents of the provision are centering their current fire on overseas depletion, figuring that's the most vulnerable.

Some independent producers have been tempted to join the attack on overseas depletion, feeling this would reduce the economic advantage of foreign oil.

According to unconfirmed reports, some Texas independents have actually called on Secretary of the Treasury Robert B. Anderson with the proposal that the Administration withdraw its support for overseas depletion.

However, such independents may not push this move if the imports controls program relieves some of the pressure on them.

Most oil men are resigned to the fact that the industry is unpopular in Washington, and that they must fight against anti-industry views on almost every issue. But as a whole, they are inclined to think the industry's position in Washington is better now than in the dark days after the so-called lobby scandal broke out in 1956, leading to the veto of the gas bill.

But an oil trade Association spokesman warns:

"The industry is still a big, tempting political target."

Who's Stupid?

"I'm not worried about a blessed thing," one oil man told Petroleum Week. "I'm stupid."

U.S. Asks 3-mi. Offshore Limit

The Justice Dept. wants the Supreme Court to establish once and for all that the offshore boundaries of all coastal states—including Texas—extend for only 3 mi.

Legislation passed by Congress in 1953 affirmed state ownership of submerged lands within their "historic boundaries"—but did not specify what these boundaries are.

The government filed a suit in late 1955 disputing Louisiana's claim to a three-league, or 10.5-mi. offshore boundary.

That case was argued before the Supreme Court last spring. But on June 24, the court invited Texas and other coastal states to join the case.

Only Alabama decided to intervene in the case. Texas, Mississippi, and Florida declined.

Texas, for example, said its claim to a three-league boundary is so unique that it could not properly be considered in the same case with other states.

But last week, the Justice Dept., acting on the court's invitation, filed an amended complaint, formally asking the court to make all Gulf Coast states parties to the case, and to set a 3-mi. boundary for each of them.

The government action flies in the face of repeated White House endorsements of Texas' historic claim to a three-league boundary. But the Justice Dept. is known to have bridled at the Texas claim all alone.

During his 1952 campaign, President Eisenhower made a Houston speech endorsing the Texas claim.

Again, when the question arose in 1954, he publicly repeated his belief that Texas was entitled, under the law, to a three-league boundary.

However, the U.S. has always insisted that, under international law, no state or nation can have a boundary farther out than the traditional 3-mi. limit.

As the Justice Dept. announcement this week put it, "One of the questions that has been raised in the present suit is whether certain treaties and statutes before and after Texas' admission to the union . . . are controlling, or whether the traditional 3-mi. limit is controlling with respect to Texas."

Texas and the other states now are expected to file briefs with the Supreme Court presenting their viewpoints. The result is expected to be a delay of several months before the court makes a final decision.

What They're Saying At API

"Here we are again faced with a whole new series of anti-oil-industry legislative measures and 'smear' investigations. It seems that the politician finds he can't lose in making smear charges against the oil industry."

—FRANK M. PORTER, API president

"The future of petroleum explorations may not be quite as dark as it seems. Most exploration men are convinced that large reserves of oil and gas remain hidden in stratigraphic traps. These traps are extremely difficult to find . . . New tools and new techniques are needed."

—C. I. ALEXANDER, Magnolia Petroleum Co.

"I know some of you say you will have no part of politics. Let me remind you that you can make it your business to keep out of politics if you choose, but nothing you can do will ever keep politics out of your business."

—ROBERT S. KERR, U.S. Senator

"It takes little imagination to predict that the next 30 years will see an even greater rate of progress than was enjoyed in the past 30 . . . and that our fundamental research program will set the pace and direction of that progress."

—H. W. FIELD, Atlantic Refining Co.

"Avoid unnecessary tension, unhealthy strain. Live a little, as they say, and you'll live longer . . . These are principles for personal conduct if you have any regard for your heart and your job."

—Dr. LOUIS N. KATZ, Chicago

"Your own trade press has frankly described the poor public relations of this industry. This area is your special concern. Basically, you have a better story to tell than you have succeeded in telling."

—EDMUND P. LEARNED, Harvard University

"If it were charged that the API research program has not done as well as it might because it has not produced any dramatic new products, or manufacturing processes, or oil fields, the answer must be that it has not done these things because it was not meant to do them . . . Its purpose is to broaden our foundation of basic knowledge . . ."

—MONROE SPAGHT, Shell Oil Co.

"Let us look at the makeup of an integrated oil company. As the saying goes, it is a combination of four legitimate widely divergent businesses and of a crap game, all rolled into one piece. The crap game, of course, is the exploratory end of our operations."

—SERGE B. JURENEV, Continental Oil Co.

"Anyone venturing abroad should remember that it is not enough merely to find oil. Crude oil brings a profit only if it is sold, and it can be sold only if there is a market for it. Developing large markets requires time, experience, and capital. I wonder how many producers looking outside their own countries have the marketing problem in mind."

—ALBERT L. NICKERSON, Socony Mobil

What's New / IN THE INDUSTRY

Alberta Producers Seek Solution to Low Demand

Alberta producers are asking the Canadian government to take speedy action to develop a "continental oil policy" to help alleviate the depressed demand for crude.

The appeal so far has been led by C. U. Daniels, president of the Calgary Chamber of Commerce. But other groups, particularly the Canadian Petroleum Assn., are supporting the move.

Daniels wrote Prime Minister John Diefenbaker requesting that the recently appointed Royal Commission on Energy (page 30) take immediate action toward finding a solution of Alberta's market pains.

One recommendation is that Canada should adopt voluntary restrictions on imports of U.S. oil (mostly into eastern Canada) unless some arrangements can be made for a "closer relationship" between U.S. and Canadian oil resources and markets.

•

Oil men should pay more heed to the publicly available facts on product demand, output, and inventories.

If oil men had done so, Frank Porter, president of the American Petroleum Institute, said this week in his report to members, many of the problems that now beset the industry might not have arisen.

Porter said the available facts constitute "as fine a body of operating information as is available to any industry." Unfortunately, he continued "and sad it may seem, it is apparent that surprisingly little heed has been paid to the situation presented by these facts."

Porter added that, while the petroleum industry is in one of its "periodic low spots," API "never has, is not now, and—I am sure—never will attempt to tell the industry how it should conduct its affairs."

•

Sohio Petroleum Co. has reduced its postings for some crudes in Nebraska, Michigan, and Texas. The cuts range from 5¢ to 15¢ a bbl.

Hackberry field crude in Nebraska was reduced 5¢ a bbl. The new posting starts at $2.61 a bbl. for 20-gravity and below and extends to $3.03 for 40-gravity and above.

Coldwater crude in Michigan was cut 15¢ a bbl. to a new flat posting of $3.10 a bbl.

A 5¢ cut was made in Texas for crudes in the Nona and San Pablo fields. The schedule starts at $3.08 a bbl. for 20-gravity and below and extends to $3.50 a bbl. for 40-gravity and above.

•

The actual and potential contributions of the Foreign Petroleum Supply Committee to national security "continue to outweigh possible anticompetitive implications," according to former Attorney General Herbert Brownell.

In the latest quarterly report to Congress on the status of voluntary agreements, Brownell said, that the Secretary of the Interior "reiterates the view that the agreement remains essential to the solution of emergency problems that may threaten the free world's petroleum supply."

•

Pan American has plugged back its record-depth Texas wildcat to 18,400 ft. and is making preparations for testing.

The No. 1-CS University, in Pecos County, was plugged back after drill pipe stuck as the hole was being drilled at 21,687 ft.

The operator has run liner below 7⅝-in. casing at 16,478 ft. for a test of the Wolfcamp and Pennsylvania formations.

Burns Elected API Chairman; Spahr a New Vice-President

H. S. M. Burns, president of Shell Oil Co., was elected chairman of the API Tuesday. Burns succeeds Jake L. Hamon, Dallas. Charles E. Spahr, vice-president of Standard Oil Co. (Ohio), was elected vice-president of the Division of Transportation. Willard M. Wilson, assistant director of the American Petroleum Industries Committee, was named secretary.

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

November 15, 1957

The government may make a new study of U.S. crude-producing capacity. True, the National Petroleum Council just completed a study in October, which placed capacity at 9,867,000 b/d. But some U.S. officials say NPC didn't consider such important factors as crude quality, and that a new, more detailed survey should be made by government agency staffers. So far, it's in the talking stage. But a decision must be made soon if the necessary funds are to be requested by President Eisenhower in his January budget message to Congress. The proposed study could end up as part of the big oil study planned by Defense Mobilizer Gordon Gray (PW—Nov.8' 57,p10).

•

Navy efforts to shut down the Wilmington (Calif.) oilfield are running into trouble. The Navy wants the Justice Dept. to sue for a halt in production from the field in San Pedro Harbor until something is done to stop further earth subsidence. However, the Justice Dept. is going slow. It can't decide whom to bring the action against—the state, the City of Long Beach, the oil operators themselves, or all three. Meanwhile, the operators are being urged to start repressuring voluntarily and stop the subsidence.

•

The long-term outlook for imports of Canadian gas is still bright. At least that's the general feeling around the Federal Power Commission. Obviously, the Canadian government's freeze on natural gas export permits prevents FPC from considering Canadian gas dependable for now. But there's a growing feeling that—in the long run—the study by the Royal Commission on Energy will result in a stable, dependable Canadian policy on natural gas exports, including creation of something like FPC.

There's some hope Canada will loosen the freeze on export permits. Quiet efforts may be made, for example, to persuade the Royal Commission that it should study natural gas policies first—thus minimizing the delay. There's even some speculation that Prime Minister John Diefenbaker will be asked to reverse his field and make a clear statement promising to honor the previous commitment to grant authority for export sales to Midwestern Gas Transmission Co. As things stand, MGT is hard-pressed to show FPC a dependable supply, or ability to obtain financing, for its proposal to sell Canadian gas in the Upper Midwest.

•

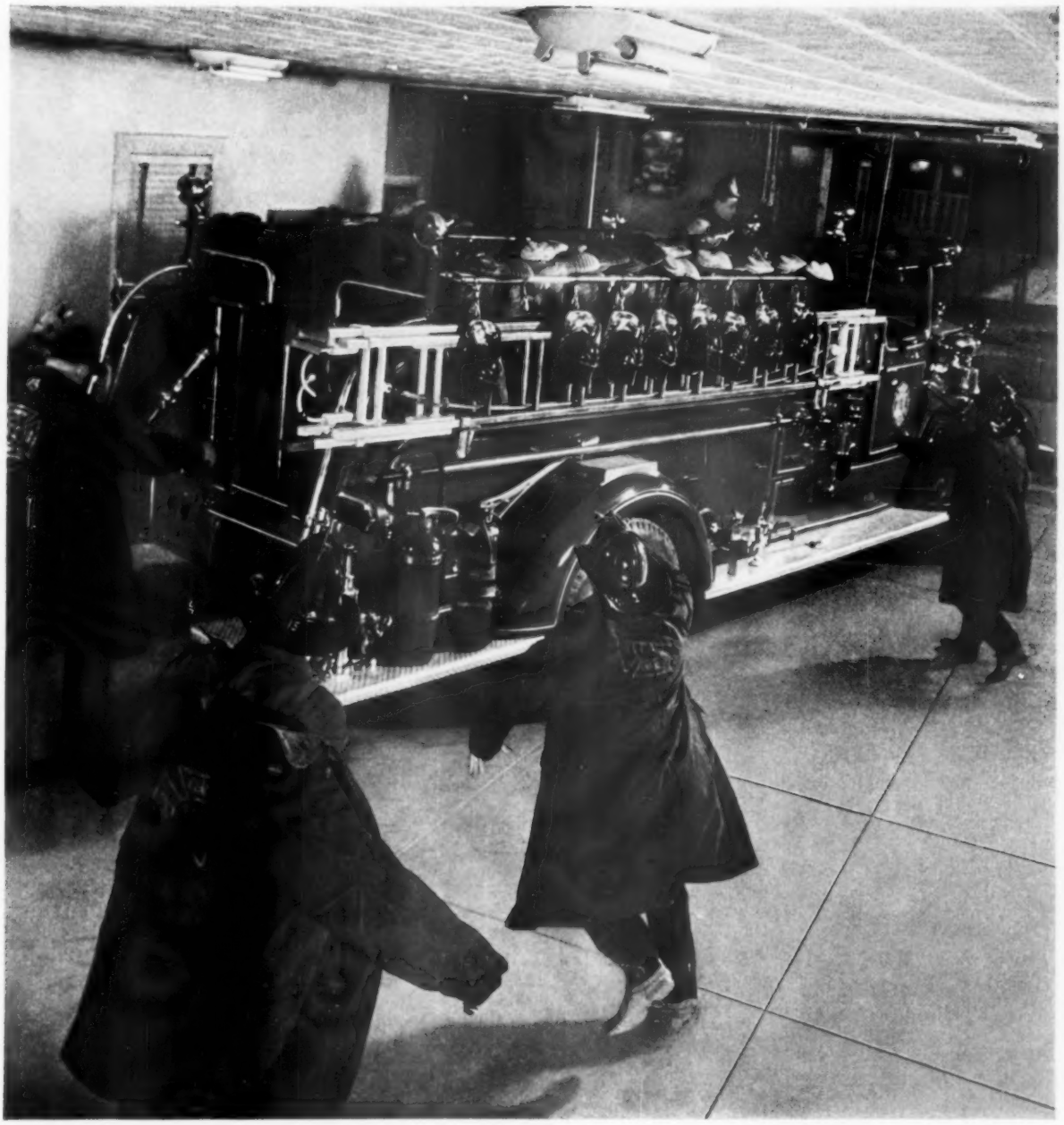
OCAW's idea for a shorter work week gets a cool reception in Washington. Top officials of the Oil, Chemical & Atomic Workers Union may campaign for a shorter work week as an antidote to prospective layoffs (PW—Nov.8'57,p11), but the Labor Dept. considers any such move premature.

•

The World Bank is unlikely to finance the proposed Pan Arab Pipeline (PW—Nov.8'57,p11). Saudi Arabia has indicated Arab-owned pipelines carrying oil through Syria to the Mediterranean could be financed through the World Bank. However, informed sources say the bank would never back such a venture in the absence of support by oil companies and Western governments.

ESSO RESEARCH works wonders with oil

Triggering the starts that save lives



On what happens in the next second or so, hinges the fate of someone's property—perhaps even someone's life! A switch is turned, a starter is pressed—an engine takes hold instantly! Fast starting, anti-stalling and many other qualities of gasoline which today add to your safety and driving pleasure were pioneered by Esso Research. In this and hundreds of ways, **ESSO RESEARCH** *works wonders with oil!*

Esso

A Drilling Mud Is Only As Good

As The Service That Comes With It! Always...

... measure mud service by

MILWHITE

mud sales company

A DIVISION OF MISSISSIPPI RIVER FUEL CORPORATION

Houston, Texas

DEPT/Exploration, Drilling, Production

Seisverter Unveiled at SEG Meet

A new instrument, the "Seisverter," which can transfer geophysical data from any existing paper to a variable density record or to magnetic tape, was unveiled this week at the meeting of the Society of Exploration Geophysicists, in Dallas.

The instrument was developed by Seismograph Service Corp., Tulsa.

Five of the units are being assembled, and will go into use after the first of the year by SSC and its subsidiaries.

The Seisverter will make possible the reevaluation of hundreds of thousands of old paper records, the company says.

By transferring old records onto magnetic tape, and/or by utilizing the variable-density record, an operator can take a "new look" at an old area without having to go to the expense of shooting it.

"In the past," the company says, "a reinterpretation of old records had to be made without the ability to change the actual record itself; therefore the interpreter was held to the basis limitations that had existed when the record was first made."

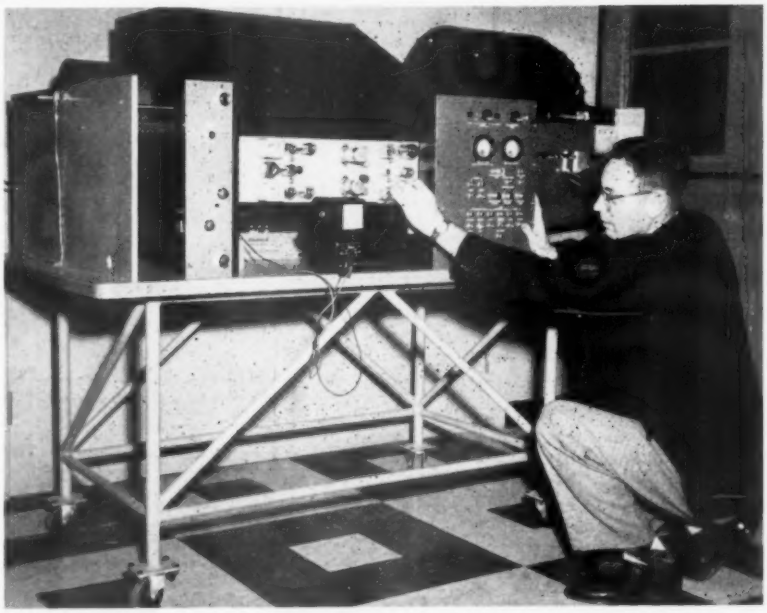
"The Seisverter provides a 'new look' at the basic data. By transferring the old records to magnetic tape before producing the new display, advantages of altering and mixing may be obtained."

The Seisverter could cause a big change in the magnetic-recording operation. Reason: a geophysical crew no longer will have to take conventional magnetic recording equipment into the field.

Instead, says SSC, a crew can use the cheaper method of recording data on photographic paper, and have it transferred later to magnetic tape. By doing this, SSC says, the costs of obtaining a magnetic recording will be substantially reduced.

Says the company: "When you consider that it costs from $10,000 to $40,000 for all component parts of a magnetic-recording setup for each geophysical crew, a lot of money can be saved by using conventional recording equipment to take paper records, then use the Seisverter to transfer the data to magnetic tape."

The Seisverter is a joint development of Dr. James E. Hawkins, director of research for SSC, and Edward J. Crossland, research engineer. They have applied for a patent on the instrument. SSC plans to lease the units on an hourly basis as soon as production is increased.



SEISVERTER gets final adjustment from Edward Crossland, research engineer for Seismograph Service Corp. Under hood are drums housing geophysical records.

The main components of the instrument are three drums, containing the tape and geophysical records to be recorded.

The instrument is contained in a steel case about 68 in. wide, 44 in. deep, and 30 in. high.

A large drum holds the conventional photographic geophysical record. It will handle any recording up to 6½ seconds of time lapse.

On another drum, the variable density is recorded, either on tape or on film. The third drum holds the magnetic tape, which is 24 in. long by 6⅜ in. wide.

The Seisverter operates automatically by an "Autotrack," which is controlled by various amplifiers.

Automatically, it will:

- Transfer the amplitude variations of a conventional record to magnetic tape.
- Give the variable-density record.
- Insert static corrections, including data on weathering and elevation.
- Apply spread correction, or "normal move out."
- Correct variations in the original record speed.

Handling of the magnetic tape is done conventionally by use of regular filtering equipment, as on any other magnetic tape. Thus, it is possible to filter out noise, and to emphasize cetain traces on the tape that have been obtained from the paper record.

Playback equipment can be a standard galvanometer-type camera, or a conventional recording oscillograph.

The average time required to transfer a complete paper record to magnetic tape with the Seisverter is about 45 minutes.

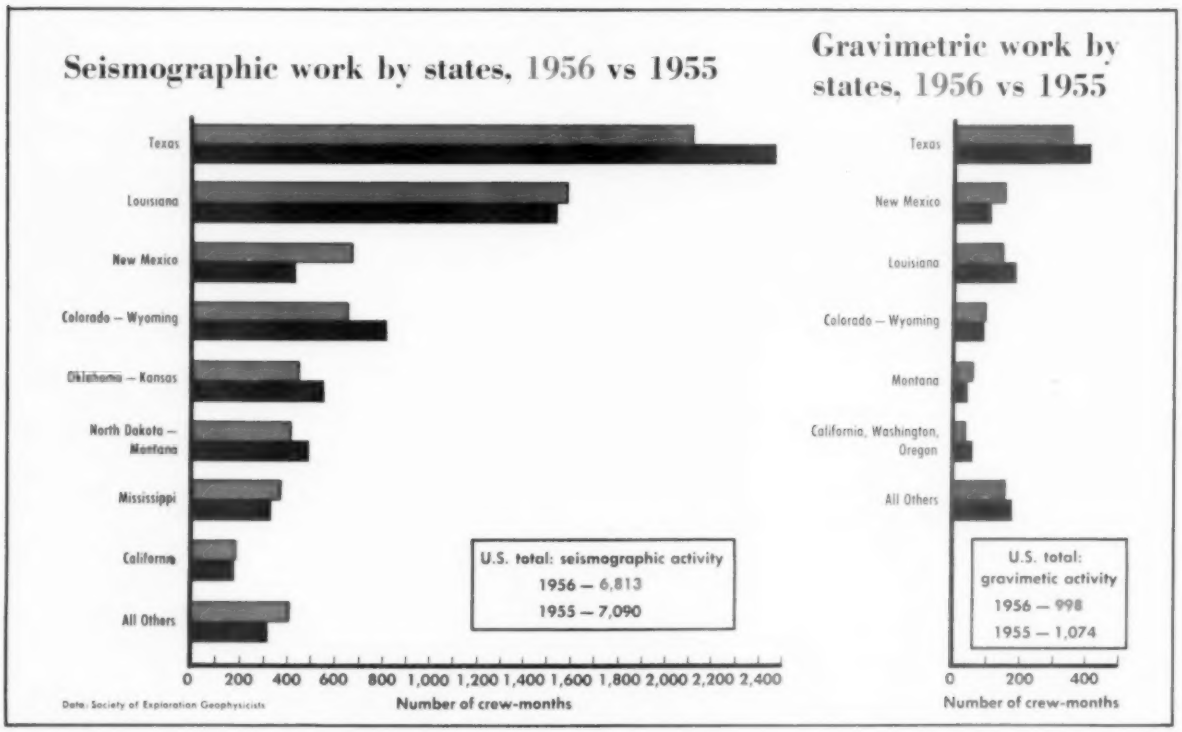
This is for a 24-trace, 3-second record, which is about average.

The Seisverter records only one trace from a paper record at a time, but can handle up to 28 traces.

A limitation to the Seisverter is that it has to "take what it gets" from old recordings.

In other words, if a paper record was made by filtering over a narrow band, only that band will show up on the magnetic tape. Even then, says SSC, the variable-density display is an asset.

"We will offer operators a package deal," says SSC. "They can bring in their paper records and we will transfer them onto magnetic tape, and evaluate the data through regular interpretive means."



SEG Reports Geophysical Data

The executive committee of the Society of Exploration Geophysicists has decided to revise its yearly report on worldwide geophysical activity, but the current report, covering 1956, was compiled as usual.

In future years, the report will be compiled in March or April, covering the previous year's activity, and will be presented at a regional meeting.

This year's report, though not read at the meeting, was compiled, as in previous years, by Homer G. Patrick, of Humble Oil & Refining Co.

The report shows that geophysical activity throughout the world reached a new high in 1956, but activity in the U. S. declined—a forerunner to this year's decline in drilling activity.

An average of 1,136 geophysical

World Geophysical Activity in 1956

(Number of crew-months)

	Seismic	Gravity
W. Hemisphere	**9,061**	**1,369**
United States	6,813	998
(for U. S. breakdown, see chart, page 33)		
Canada	1,423	88
Alberta	978	52
Saskatchewan	230	3
Manitoba	16	1
British Columbia	182	3
NW Territories	17	2
Eastern Canada	—	27
Mexico	200	60
South America	538	216
Venezuela	175	35
Argentina	132	36
Colombia	87	36
Brazil	90	64
Others	54	45
Central America, West Indies	87	7
E. Hemisphere	**1,983**	**855**
Europe	1,095	173
Germany	408	60
France	295	24
Italy	210	38
Others	182	51
Africa	455	243
N. Africa	262	152
Other Africa	193	91
Middle East	200	227
Aden	—	12
Dhofar	12	3
Israel	13	17
Iran	6	—
Iraq	55	36
Kuwait	12	—
Persian Gulf	20	38
Saudi Arabia	48	24
Turkey	20	74
Others	14	23
Far East	233	212
Australia	36	48
New Guinea	24	36
India	36	27
Indonesia, Papua, Japan	80	42
New Zealand	12	4
Pakistan	42	48
Others	3	7
TOTAL WORLD	**11,044**	**2,224**

Data: Society of Exploration Geophysicists

Dresser's Turbodrill has been found vastly superior

for straight hole drilling in crooked hole country. We welcome inquiries, and especially invite discussion of problems of hard drilling in difficult situations, drilling in extremely hard formations and crooked hole drilling. Our engineers will be glad to consult with you.

TURBODRILL DIVISION

DRESSER INDUSTRIES, INC.

P. O. BOX 1106
DALLAS 21, TEXAS

crews of all types were employed in 1956, compared to an average of 1,119 crews in 1955. These crews did 13,628 crew-months of geophysical work in 1956, against 13,430 in 1955.

Biggest worldwide gain was made in gravity work, which increased 8.4% over 1955.

Seismic work increased by 0.6%, while magnetic work declined 8.2%.

Other methods of exploration—primarily electrical—showed an increase only in the Western Hemisphere, but accounted for a very small part of all geophysical work done.

Although the U. S. continues to lead the world in geophysical work, its percentage share of world geophysical activity is dropping. Total geophysical work done in the U. S. declined 4.6% in 1956.

An average of 568 seismic crews operated in the U. S. during 1956, compared to the 1955 average of 591 crews, a reduction of 3.9%.

Total gravity work in the U. S. declined by 7.1%, with 83 crews operating during 1956, compared to 90 crews in 1955.

Though total geophysical work was down in the U. S., gains were made in individual states and regions.

In seismic activity, gains were registered in the Four Corners area, Mississippi, California, and Louisiana.

In gravity work, increased activity was recorded in New Mexico, Colorado, Montana, and Utah.

Elsewhere in the world, the most significant gains were chalked up in the Eastern Hemisphere, as they were in 1955.

Seismic work there rose 24.8% over 1955, and gravity work went up a sizable 37.7%.

A large gain in geophysical work was made in Europe, with Germany, Italy, and France the scenes of heaviest activity.

Geophysical activity increased substantially in Africa in 1956. Seismic work was stepped up in the French Sahara and in Libya.

In the Middle East, seismic operations increased from 123 crew-months in 1955 to 200 crew-months in 1956.

Gravity work in the Middle East also increased sharply: 227 crew-months in 1956, compared to 118 crew-months in 1955.

In the Far East, a considerable amount of geophysical work was carried out in Australia, Netherlands, New Guinea, and Japan during the year.

For the Western Hemisphere as a whole, geophysical work declined by 3.7% from 1955.

On imports, Thompson and Carson agree . . .

The Only Alternative Is Controls

Two regulatory officials agreed at this week's API meeting in Chicago that the voluntary imports plan has to work if a chain reaction of direct federal controls throughout the industry is to be avoided.

Both Ernest O. Thompson, senior member of the Texas Railroad Commission, and Matthew V. Carson, imports administrator, expressed this sentiment before the Production Division.

Neither saw strict federal controls as an idle dream or a flight of fancy should the importing companies fail to adhere to the voluntary plan.

First to warn of the dangers ahead if the voluntary plan fails was Texas Railroad Commissioner Ernest O. Thompson.

He listed several points as wise to consider in a look to the future months of 1957 and the first quarter of 1958, especially in regard to impatience with the voluntary restriction effort as opposed to strict Federal controls:

- The industry would wind up in a public utility status.
- Price of crude and all products would come under federal scrutiny.
- State oil-production quotas in commerce would be assigned in the so-called consumer interest.
- All products would be higher in price, and sales opportunities curtailed by the limits imposed.
- The federal board would no doubt arrogate to itself, or get through Congress, the power to say when and where coal would be used instead of oil or gas. This end-use control would be urged by the coal people, and then by the sale oil producers.

Thompson also was unhappy with the failure of other oil-producing states to cut allowables as sharply as Texas.

He expressed hope these states would re-examine their stock position and act accordingly to ease the common problem caused by over-supply.

Thompson reminded the group that it was not so long ago that East Texas crude was being sold at 10¢ per bbl; world markets were disrupted, and other Texas fields could not compete with the deluge of cheap oil. He continued:

"Texas brought this field and all other Texas fields under strict waste-prevention controls, and economic order was restored.

"Due to Suez, we overproduced last spring; we must now work off these stocks by lessened current production and decreased imports."

Matthew V. Carson, imports administrator, saw only two alternatives —voluntary cooperation on the part of the entire industry, or the spectre of mandatory controls.

But he stressed that only so long as the voluntary method is successful does the industry have any strong measure of insurance against government controls—either by administrative action under the Trade Agreements Act or by future legislation.

"Once controls on one segment of any industry have been established," said Carson, "a chain reaction is set up which almost invariably leads to increased government control over all phases of activity. If supplies are restricted, a clamor for price controls arises from consumers when costs go up. Price controls, in turn, lead to rationing . . . then some people turn to black or gray market activities . . . leading finally to laws against those who sell or purchase illegally."

Carson stressed that the vast majority of importing companies, with considerable sacrifice and financial hardship, are cooperating fully.

At the same time, he said, "I do have to report that a few companies in the industry have so far been unwilling or unable to adhere strictly to the voluntary program. But these firms constitute a small, lonely minority."

He specifically named Eastern States Petroleum & Chemical Corp., Sun, and Tidewater—out of 25 importing firms—as the ones that still are not committed fully to cooperation with the government.

Carson noted that imports in September dropped to 782,500 b/d in Districts 1-4—only 16,100 b/d above the revised recommendation.

Turning back to Eastern States, Sun, and Tidewater, Carson said the three exceeded suggested allocations for September by over 38,000 b/d.

According to estimates, these three will exceed allocations by 46,000 b/d in October, 34,000 b/d in November, 46,000 b/d in December, and 38,000 b/d in January and February.

Except for these overages, he said, imports actually would be below the goal.

Carson assured the group that imports into District 5 will be reviewed Nov. 25-26, and, in all probability, another look will be taken at Districts 1-4 after Jan. 1.

PROVED **BEST** IN THOUSANDS OF WELLS.....

IN THOUSANDS OF WELLS.....

BROWN DUO-PAK

PROVED **BEST** OF WELLS.....

PROVED **BEST** IN THOUSANDS OF WELLS.....

More for your money...

Automatic Release

Simply picking up the tubing releases the setting mechanism and the packer may be reset or pulled. *No rotation is required to unseat packer.*

Completely Drillable

The entire packer, except the stem, is completely drillable in cases of extreme emergency.

Holds High Differentials

The split cups effect a dual seal with the casing and tubing mandrel to provide tremendous resistance to high differential pressures.

For information on all Brown Packers, including parallel string completions, contact nearest representative or write to Brown Oil Tools, 8490 Katy Road, Houston.

BOT

BROWN

OIL TOOLS, INC.

Standardization Would Cut Costs

Machinery that is successful not only from an engineering standpoint but also from an economic one is needed if production and drilling costs are to be greatly reduced.

This thinking was laid before a petroleum-industry buyers group at this week's API meeting in Chicago by F. M. Mayer, of Dallas, president of Continental-Emsco Co.

Mayer pointed out that API, in cooperation with manufacturers, many of whom are members of the Petroleum Equipment Suppliers Assn., has effected savings of untold millions by standardization — and that further savings are definitely possible.

"Cost-wise," said Mayer, "It is unsound to manufacture and merchandise a variety of products for the same use, though of slightly different design.

"Much of this is brought about through slight differences of opinion on the part of the engineers from purchasing concerns.

"Perhaps all of us, including our own engineers, have gone a little overboard on frills. Some gadget, some slight change in a piece of machinery, may have a little merit, but may not be too economical when weighed against the extra cost."

Mayer stressed that such practices run up costs to other purchasers by eliminating the savings of assembly line production.

Offered as one answer to the dual problem is standardization.

"If there were more standardization, with its resultant reduction in engineering expense, more economical production runs, lowered inventory, and lessened obsolescence, the prices on a considerable amount of both drilling and producing machinery could be reduced.

"The drilling industry, which is being forced through meager returns to cut its costs, has partially recognized this, and is tending toward more machinery standardization."

But while standardization was offered as one answer, criticism was heaped upon the industry for its treatment of the drilling contractor.

Mayer pointed out that the drilling contractor has taken over 94% of all drilling in the U. S. He added: "The producing group cannot own equipment and drill wells as economically as the drilling contractor. If the producers could, they would be doing it. But if conditions do not change, the producers may have to reenter the drilling business and assume the responsibility of its tremendous investments and need for great flexibility.

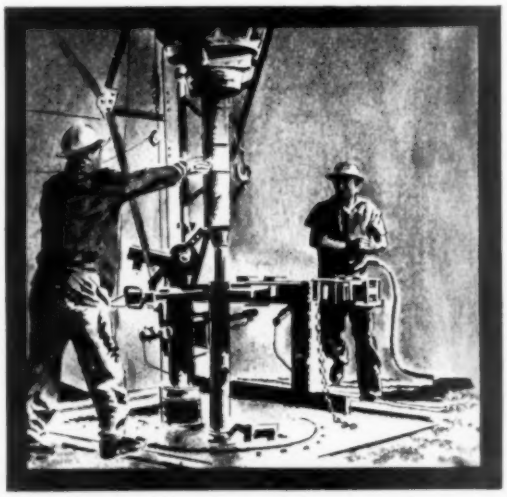
"The recompense the contractor is receiving for the work he is doing is not commensurate with the investment he has, the risks he takes, the initiative and knowhow he possesses, and the tax burden he must bear if any profits are made."

The end result of the pressure upon the contractor is a sick drilling industry.

But Mayer believes the drilling contractor is too valuable to the oil industry to be in that category.

"Many of our old-line contractors," he said, "are attempting to get out of the business, and the economic climate in the drilling phase of the oil business is such that it is increasingly difficult for young men to enter it."

Mayer reminded the purchasing group that their experience should make them appreciate that the lowest price is not always the cheapest price.



TWO MILES DOWN—

that's where performance really pays off—and where YUBA BARITE pays its biggest dividends.

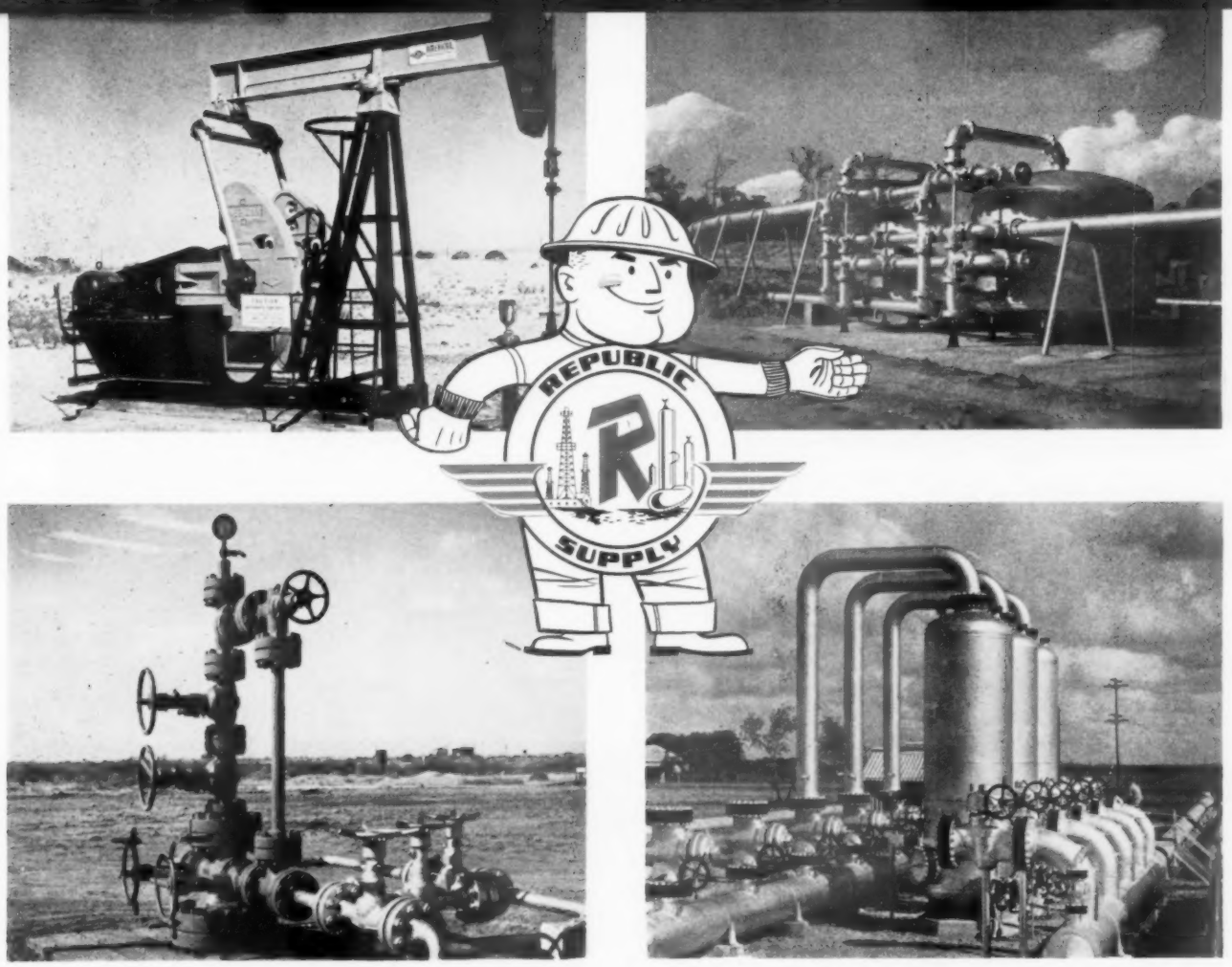
A consistently high quality weight material available any time of the day or night from strategically located distribution points.

Production facilities are located at:
Emeryville, California. Fresno, California.
Southgate, California. Salt Lake City, Utah.

YUBA MILLING DIVISION

METALS DISINTEGRATING COMPANY, Inc.

GENERAL OFFICES: Dept. A, Elizabeth B, N. J.



There's a *Flying "R"* near YOU...

...supplying the oil, gas, chemical and mining industries.

Wherever you are in the oil country, look for the Flying "R" . . . symbol of Republic Supply . . . ready to serve YOU!

You'll find REPUBLIC SUPPLY stores well stocked with the industrial products you need . . . products famous for their high quality, manufactured by companies known for their fairness in business dealings.

Courteous and experienced supply men are ready and able to serve all your equipment and supply needs. They will give you authentic and reliable information concerning your supply and equipment needs, and can help you solve your equipment problems.

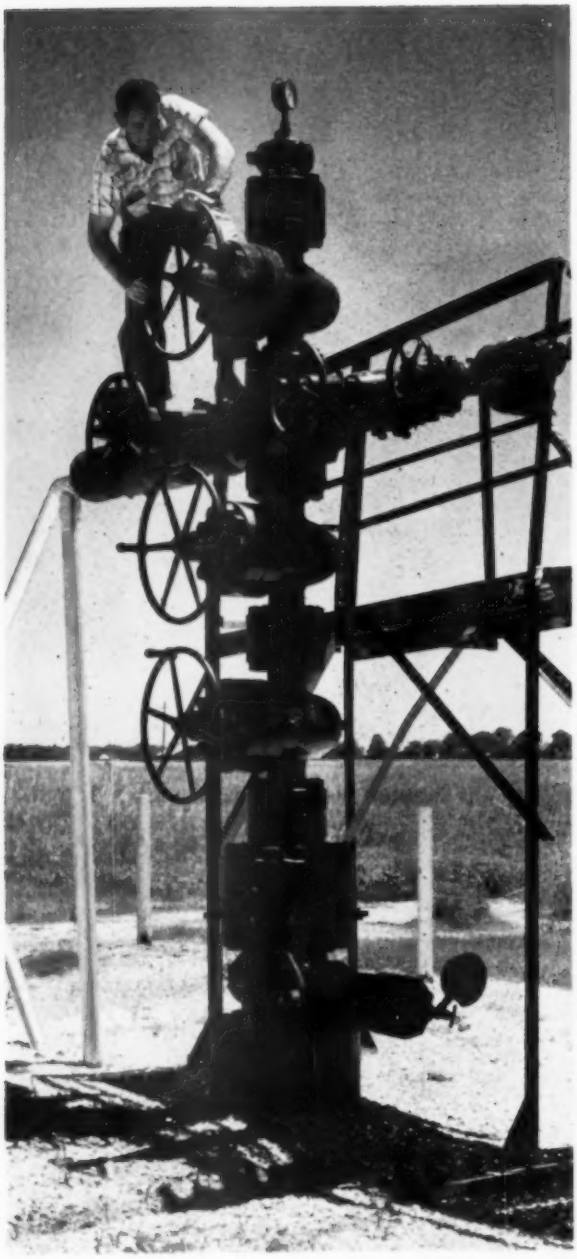
Next time you need oil field or industrial equipment and supplies, be sure to contact your nearest Republic Supply man. Better still, stop in at one of the conveniently located stores where you'll learn first hand that REPUBLIC SUPPLY'S combination of experienced personnel, quality products and wide coverage assures you of fast, satisfactory service.

And remember . . . regardless of where you are located in the oil country . . . You're not very far from a Flying "R".

Republic Supply

COMPANY

OKLAHOMA CITY, OKLA.



CHRISTMAS TREE on Sunray Mid-Continent Oil Co. well in South Louisiana has to be huge. Bottomhole pressure is 10,000 psi.

BLOWOUT PREVENTER is installed to help tame a high-pressure well. This "Hydril" handles more than 10,000 psi. of pressure.

Drilling Deep? Use Giant Equipment

"King-size" equipment is being used by Sunray Mid-Continent Oil Co. in drilling and completing oil and gas wells in the high-pressure Lafayette (La.) area.

Shut-in pressures in this area run up to 10,400 psi. in some wells drilled to about 13,000 ft. Sunray officials say they just can't take chances. Therefore, the heaviest, best-suited equipment available is used.

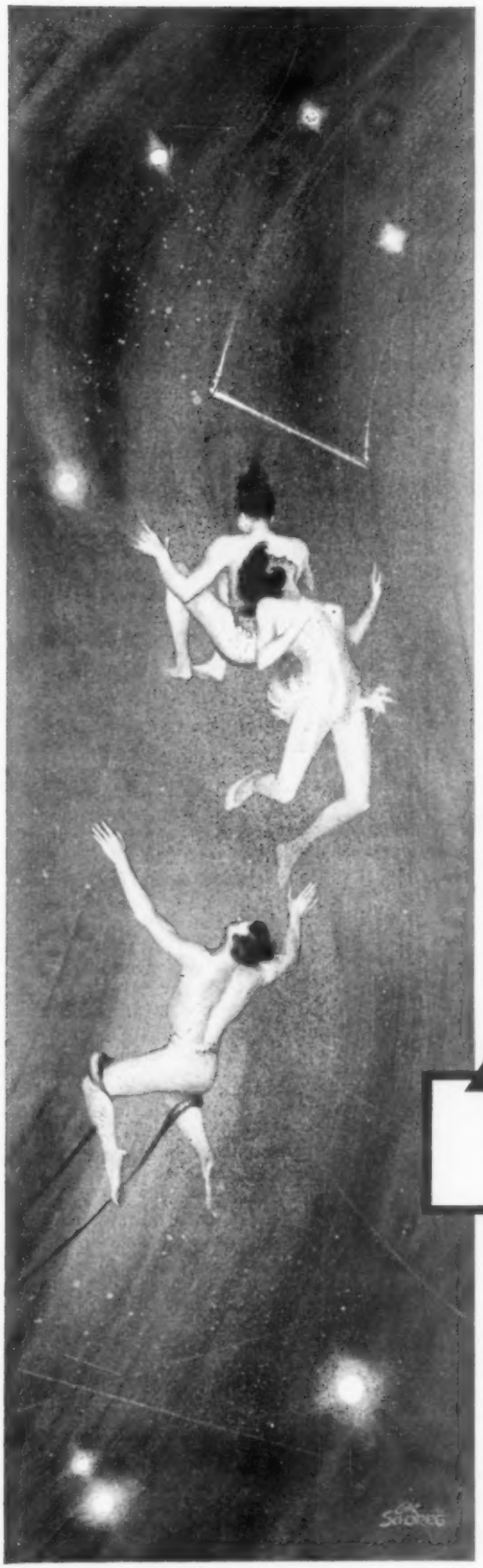
Keith Lindley, company superintendent at Lafayette, says:

"Drilling in excess of 2 mi. below the surface in South Louisiana almost always means that, if any oil or gas formations are encountered, they will be high-pressure. Even the salt-water-bearing sands contain water at pressures requiring heavy muds to control them."

In one area in which Sunray operates, he adds, subsurface pressure increases from a relatively normal 4,500 psi. at 10,000 ft. to about twice that at 11,000 ft.

"To overcome such obstacles requires careful planning, with money well spent, in order to save," Lindley reports.

Muds weighing in excess of 18 lb. per gal.—2½ times the weight of water—have had to be used in the



Efficiency

When tough jobs look easy...
swinging along to completion quickly,
economically and exactly as
specified...that's efficiency...routine
with Brown & Root in
engineering and construction.

BROWN & ROOT, INC.
Engineers - Constructors
POST OFFICE BOX 3, HOUSTON 1, TEXAS

No. One Wall Street, New York 5, New York

Brown & Root de Mexico, S.A. de C.V., Mexico City, Mexico

Brown & Root Construcciones, S.A., Caracas, Venezuela

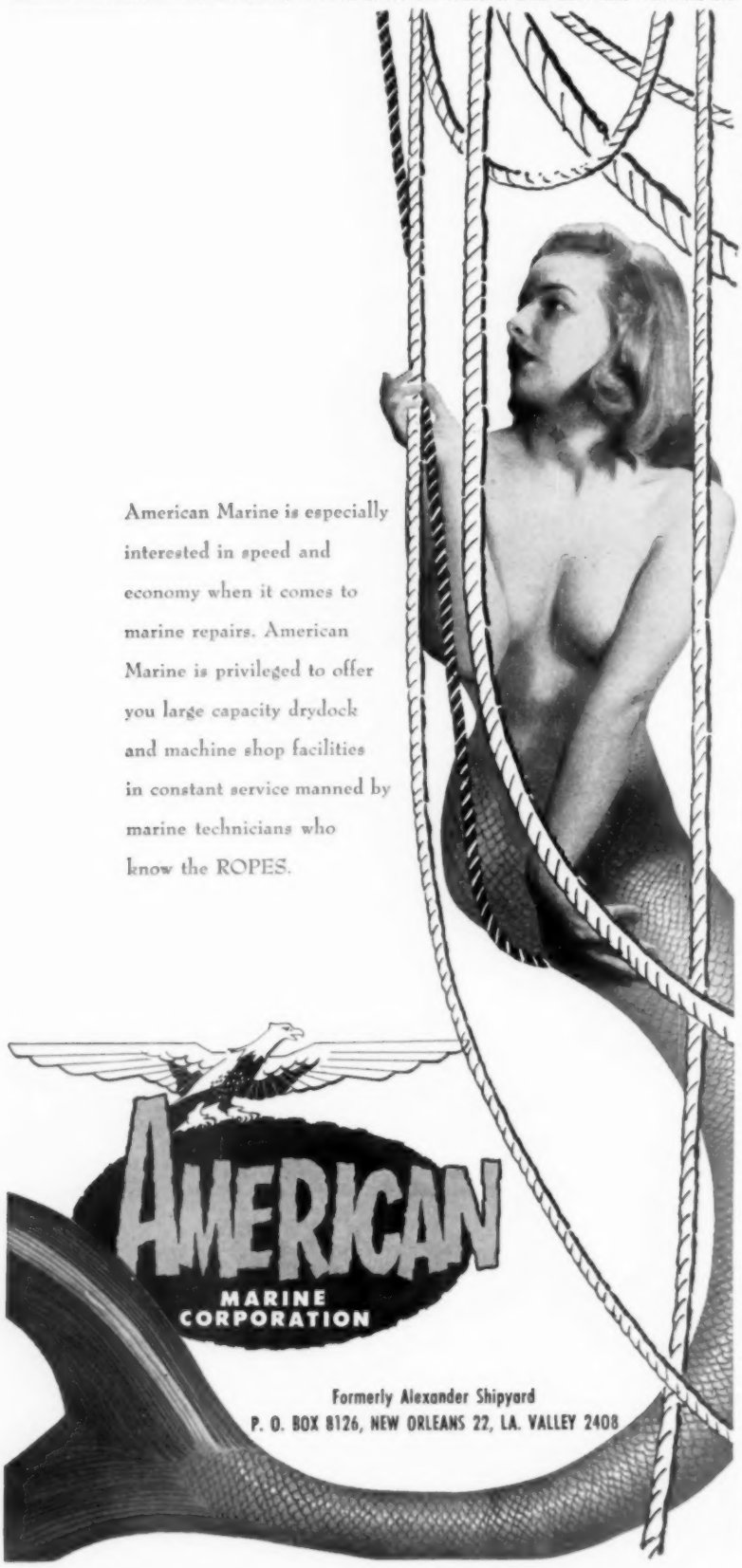
Brown & Root, Ltd., Edmonton and Calgary, Alberta, Canada

Brown & Root, S.A., Panama City, Panama

Brown & Root, LTDA., Santos, São Paulo, Brazil

CABLE ADDRESS—BROWNBILT

DESIGNERS AND BUILDERS— DRILLING BARGES, WORK BOATS, TUGS, RIVER BARGES, ETC. QUICK MARINE REPAIRS AND SERVICE—TWO DRYDOCKS, MACHINE SHOP, GAS FREEING, SAND BLASTING, PAINTING, ETC.



American Marine is especially interested in speed and economy when it comes to marine repairs. American Marine is privileged to offer you large capacity drydock and machine shop facilities in constant service manned by marine technicians who know the ROPES.

AMERICAN
MARINE
CORPORATION

Formerly Alexander Shipyard
P. O. BOX 8126, NEW ORLEANS 22, LA. VALLEY 2408

Duson field area. These muds cost the company about $18 a bbl. The mud in the circulating systems of these wells will have a value that can be as much as $35,000.

"This mud is maintained by use of desanders, degassers, and centrifuges," says Lindley. "Lost circulation with muds not only heavy enough to prevent a blowout, but so heavy that they fracture the subsurface formations, create one of drilling's most costly problems."

Drilling costs may range from $100,000 for a trouble-free well to more than $500,000 for tougher jobs.

Some of the wells drilled in this South Louisiana region can cost companies as much as $1½-million to drill and put on production, and some of the deepest tests have cost considerably more than that.

Long strings of 9⅝-in. casing and high-pressure blowout preventers are used to control the high pressures and lost-circulation zones encountered, says Lindley.

This casing is often run at depths of from 11,000 ft. to 15,000 ft., Lindley says, adding, "We recently ran a string to 13,000 ft. ourselves."

Additional high-strength tubular products (7 in., 5 in., 2⅞ in., and 1¼ in.), all with special premium-threaded joints, are used to make completions that can be safely operated at surface pressures as high as 10,000 psi.

"All of these tubular products are carefully inspected by the best methods available in the industry today, to detect any flaws before their critical use," Lindley continues.

"In a completed well, as much as $250,000 in tubular products may have been installed by the time we complete it for production."

Giant Christmas trees for high-pressure wells in the Lafayette area can cost as much as $25,000. They can withstand wellhead pressure in excess of 10,000 psi.

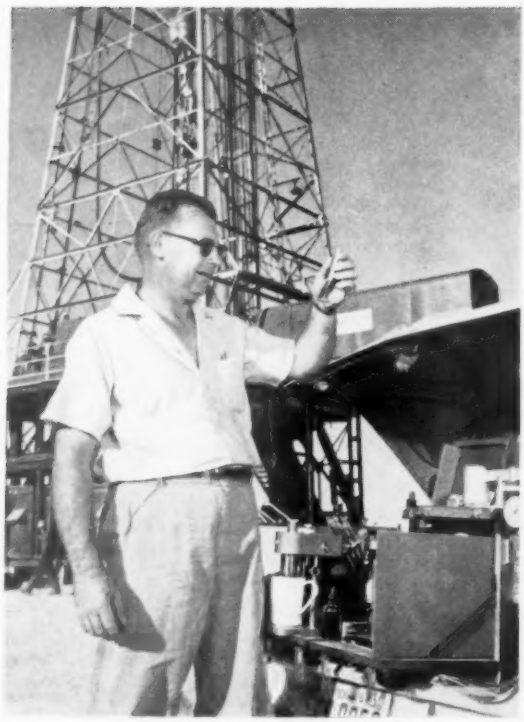
"The highest-pressure well we have completed to date in this area has a shut-in pressure of 10,400 psi., just below 13,000 ft.," says Lindley. "The Christmas tree on a well of this type may have as many as five different valves at which it can be shut in, plus two or more automatic safety valves."

Operating pressures of Sunray wells range from 4,000 psi. to 8,000 psi.

"Nothing is so costly as a blowout," adds Lindley, "which may cost several million dollars. But through planning by our technicians, and adequate mud, pipe, drilling and operating programs, we have been able to control all programs encountered."

DRISCOSE*

THE PURE and SIMPLE ANSWER TO YOUR MUD CONTROL PROBLEMS



Capable Driscose representatives are ready to give you expert technical assistance on your mud problems.

HIGH PURITY DRISCOSE (99+% active CMC) has proved its performance in thousands of wells under universal applications. This unsurpassed purity means you get the properties you need for a stable, trouble-free mud system with less material . . . *a little Driscose goes a long way.*

SIMPLE SOLUTIONS to costly drilling problems are made possible with a complete line of versatile Driscose systems which can be "tailor-blended" to suit your specific job. High Viscosity (99+% CMC), Medium Viscosity (99+% CMC) . . . and Technical Grade (72+% CMC) are regularly available. Other specific types can be furnished on request.

Increasing the range, speed and over-all economy of your drilling operations has been a major aim of Drilling Specialties Company since it introduced the use of CMC in well drilling operations. Drilling Specialties Company, with more than ten years of valuable experience in the use of CMC in the field, continues to research and pioneer basic and specific applications of this versatile chemical.

Order your supply of Driscose from your regular mud dealer today!

ONE OF THE BEST THINGS THAT EVER HAPPENED TO DRILLING FLUIDS!

DRILLING SPECIALTIES COMPANY
Bartlesville, Oklahoma

*Driscose is a trademark for Sodium Carboxymethylcellulose.

Path Clearing for Seeligson Unit

The way has been all but cleared for the start of a very complex unitized pressure maintenance program in the Seeligson field, Jim Wells and Kleberg Counties, Tex.

The latest hearing on the proposal was held last week by the Texas Railroad Commission. Final approval, though still some months away, is considered certain.

The Nov. 7 hearing was called in order to give attorneys for W. A. Richardson, et al., working interest owners in the field, sufficient time to determine whether any objection was to be raised to the amended proposals submitted to the commission at a hearing Oct. 24.

At that hearing, the Richardson attorneys said they had no objection to commission approval of the unit, as such.

At the hearing Nov. 7, the Richardson group decided to join the unit, and endorsed the rules as proposed by the unit operators before they were altered by agreement at the last meeting.

The operators had requested the Oct. 24 hearing to seek approval of the unit plan, a reclassification and redesignation of zones, and amendments to the field rules (PW—Nov. 1'57,p37).

Company engineers, geologists, and lawyers have been working on the unit plan for more than seven years.

A unitized gas production program was set up in 1948, with Magnolia Petroleum Co. as the operator of the combined casinghead and cycling plant. (Sun Oil Co. will be the operator of the proposed unit.) But the need for a unitized gas and oil operation was considered necessary when pressures decreased in the oil zones as the oil migrated into gas caps.

Also, the gas unit had to be limited to nonassociated gas reservoirs, and associated gas reservoirs with small oil rims.

An electronic computer was used to calculate the thousands of problems involved in the proposed unit. Over 1.5-million data cards were compiled, and more than a year was required to remap all of the oil- and gas-bearing zones.

Seeligson field covers more than 16,000 acres in the two counties, but the proposed unit would not extend into Kleberg, where Humble Oil & Refining Co. is owner and operator.

At the Oct. 24 hearing, a Humble attorney said his company was offered a chance to come in on the same basis as the other operators, but chose not to do so.

A cooperative program between the unit operators and Humble is being worked out, however.

The Seeligson Unit Operators Committee told the commission that those operators in the old unit who do not sign the new agreement will continue to participate in production under the old contract.

Jack M. Winn, committee chairman, said 97.97% of working interests and 85.31% of royalty interests in the unit signed the agreement.

Winn explained that within the outer limits of the entire unit area, embracing 14,238.56 acres, working interests signed account for 13,893.94 acres, or 97.58%, and royalty interests signed account for 12,388.34 acres, or 87.01%.

The unit is one of the toughest ever proposed because 58 reservoirs, in many zones, are involved. To make matters worse, some of the reservoirs have gas caps, and some don't.

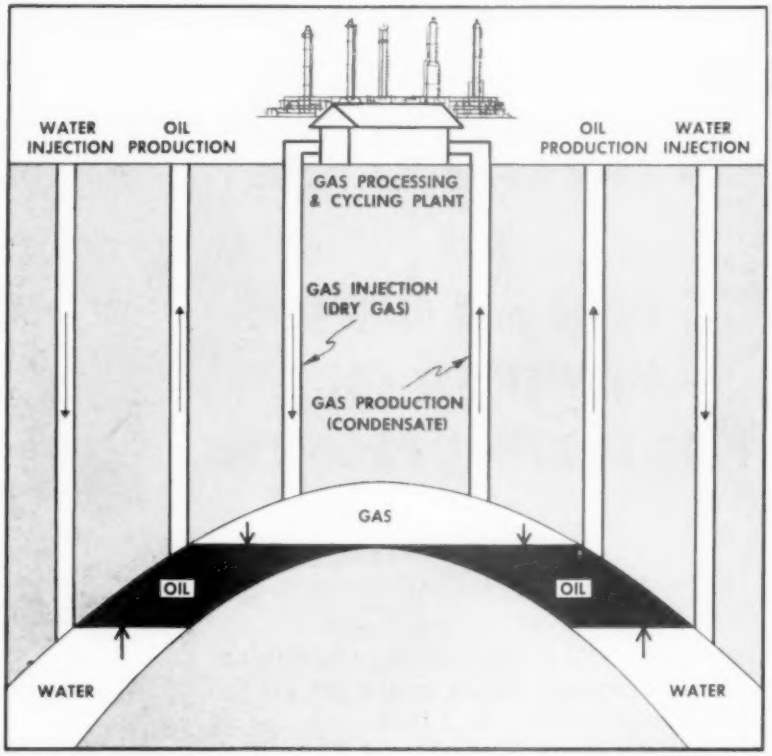
The field is a faulted anticlinal structure, lying on the eastern and southeastern downthrow side of the major Vicksburg Flexure. There are three subsurface highs. To date, more than 70 distinct reservoirs, and more than 30 producing zones, have been found.

After the field was discovered, the various pay zones were identified by numbers—8, 9, 10, and so on. When different pay sections within these zones were found, a letter was attached to the zones—19A, 19B, and so on. The proposed unit designations for these zones are broken down even further.

As of Oct. 1, this year, there were 672 active wells in the entire field (all zones), 239 of which were dual completions, for a total of 911 completions, according to the Seeligson Engineering Committee.

Of these wells, 588 (794 completions) are in sands 20C-4 and above. And of this total, 464 wells (637 completions) are in the unit area.

Development to date has completely defined zones 20C-4 and above; zones below that level have not been completely defined. Although these lower zones are not included in the proposed unit, some of them may be brought in later. The zones in the unit (20C-4

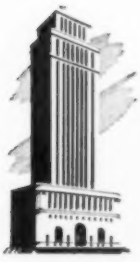


DOUBLE BARRELLED injection program is expected to boost the oil take from the Seeligson unit by some 60-million bbl. In the proposed pressure maintenance program (above) water will be forced into water reservoirs underlying the oil sands, and gas will be forced into the gas caps that lie above them.

DOMINANCE IN CANADA'S OIL AND GAS INDUSTRY

Famed Montreal landmark, the beacon-topped tower of the Royal Bank's Head Office building, dominates the skyline. Dominating, too, has been this bank's role in the growth of Canada's oil and gas industry. Since the earliest days of the country's petroleum development, the 'Royal' has been known as Canada's Oil and Gas Bank. Today, through some 300 on-the-spot branches throughout the oil-rich western provinces, and with a special Oil and Gas Department at Calgary, the bank serves an ever increasing number of oil and gas clients, including many of the most prominent in the field. Whatever phase of the industry you are engaged in, you will find many advantages in making the Royal Bank *your* bank, too.

We do not provide information on oil securities.



THE ROYAL BANK OF CANADA

Canada's Oil Bank

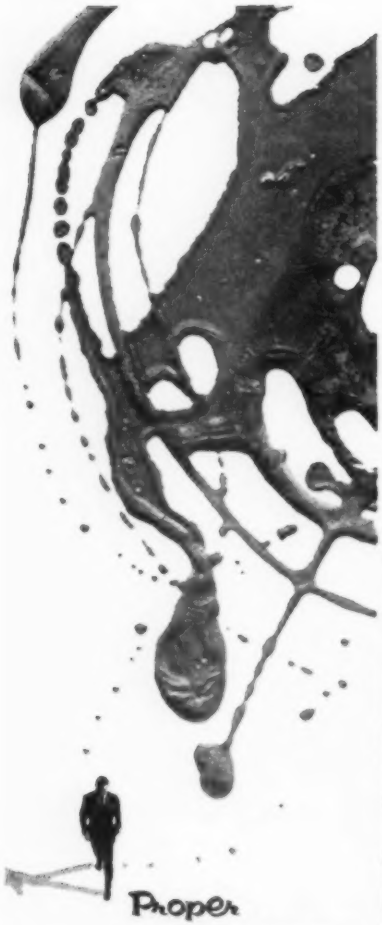
New York Agency—68 William Street, New York 5, N. Y.

Head Office—Montreal

Assets exceed 3½ billion dollars

Over 900 branches in Canada, the West Indies, Central and South America. Offices in New York, London and Paris.

For a free map of Canada's oil and gas fields and a list of the Royal Bank's current "Oil and Gas Bulletins," write to The Royal Bank of Canada, Oil and Gas Department, 509 Eighth Ave. West, Calgary, Alberta.



Proper interpretation sets you straight

The true worth of data can be realized only through interpretation. And only through proper interpretation, based on judgment and knowledge, can the fullest information be derived from the data. You can depend on the interpretation of gravity, magnetic and seismic data at Gravity Meter Exploration Company, Esperson Building, Houston, Texas.

GMX

A. C. Pagan
L. L. Nettleton
N. C. Steenland
Rodman Saville
M. W. Baynes

and above) range from about 4,500 ft. to 6,100 ft.

General data sheets submitted on each of the 58 reservoirs showed that the oil-bearing area of these reservoirs varies from 11 acres to 9,292 acres, and the gas-bearing area varies from 29 acres to 7,048 acres.

R. K. Guthrie, chief engineer and manager of the engineering committee, said all reservoir rocks are of sandstone, with average porosities ranging from 19.3% to 25.7%, and permeability ranging from 40 millidarcys to 705 millidarcys.

He added that reservoir performance histories show that all reservoirs from which appreciable production has been obtained have undergone significant pressure drop.

It's estimated that the water and gas injection program will increase oil recovery by 60-million bbl. from only 18 of the 58 reservoirs. These 18 reservoirs contain 97.9% of the recoverable oil reserves.

These reservoirs also account for 67.2% of the recoverable gas reserves within the unit area.

Additional oil recovery also is expected from the portion of the field outside the unit area as a result of cooperative programs worked out with Humble.

The remaining 40 reservoirs included in the proposed unit are of insufficient volume, areal extent, and/or content to support economic fluid injection programs, according to one operator's witness at the hearing. But it is necessary to include them in the unit anyhow, he said.

This is so because the 40 reservoirs will provide a necessary and adequate source of make-up for fuel and shrinkage losses in the operation of the gasoline and cycling plant. These reservoirs will help increase recoveries from those zones for which fluid injection programs are proposed.

Also, unitized operation of all reservoirs down to and including zone 20C-4 is necessary to coordinate the depletion of each in such a way as to avoid excessive pressure differentials between reservoirs in the complex field.

If pressurized differentials between adjacent reservoirs were to become excessive, they conceivably could cause severe waste of oil and gas by breakdown of the cement bond between casing and rock formation.

While the amount of pressure differential that would cause such a breakdown is not known, it is proposed that under unit operation, pressure differentials between adjacent reservoirs will not exceed 400 psi.

In general, the operators propose gas injection into the caps of the 18 major reservoirs and/or water injection into the underlying water-bearing formations; in effect, a sort of giant squeeze.

Under present plans, the existing gas injection and processing facilities would be expanded, and injection facilities would be installed for pressure maintenance in those reservoirs where conditions are such as to justify pressure maintenance and/or cycling operations. Total cost for putting the program into operation: $1.5-million.

The cycling of all-important gas caps is proposed. Such cycling is to be extended through the thin oil columns of certain reservoirs as a means of increasing recovery from these minor oil accumulations.

The 18 reservoirs in which pressure maintenance and/or cycling operations are proposed are Nos. 10, 13A-02, 13A-05, 14B, 16D, 17-02, 17-05, 18A-05, 19B-03, 19C-04, 19D-01, 20A-03, 20A-05, 20B-03, 20C-02, 20C-13, 20C-15, and 20C-44.

Evidence indicates that there are 12 reservoirs (including two of the major 18) which contain insufficient oil reserves to justify pressure maintenance operations.

These 12 are 12B-05, 13A-05, 14C-02, 16E-01, 17-02, 18A-02, 18B-02, 18C, 18D-02, 18D-06, 19D-03, and 19D-06. Of these, only zones 13A-05 and 17-02 are suitable for cycling.

It is recommended that these 12 reservoirs be declared salvage oil operations, and that they be permitted to produce as gas reservoirs, as long as no well produces more oil per day than the yardstick allowable for its completion depth.

Fourteen oil reservoirs, all of limited volumetric and areal extent, are considered performing satisfactorily at present. These 14 are: 12A-06, 13A-07, 13C, 14C-06, 16B, 16C, 19C-06, 19C-08, 19C-70, 19D-05, 19D-07, 20A-50, 20B-07, and 20C-01.

It is proposed that no change be made in the treatment of these reservoirs at this time. Gas production from them, however, would be used for make-up purposes.

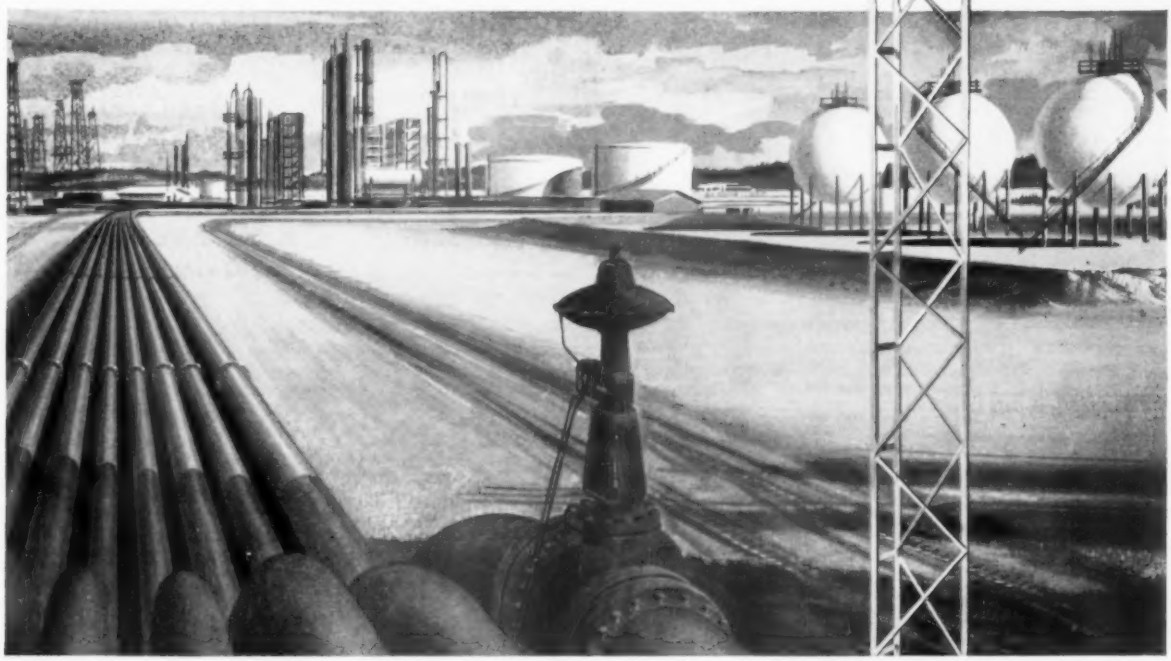
The remaining 16 reservoirs within the unit are identified as nonassociated gas reservoirs. All are too small to justify cycling, except on (No. 16), which already has been cycled.

The 16 are 9B, 11B, 12A-02, 12B-01, 12C, 13B-06, 14A, 14A-10, 14D, 15, 16E-07, 18A-01, 18A-03, 18B-03, 18D-05, and 19B-07.

It's proposed that these reservoirs be classified as nonassociated gas reservoirs, thereby permitting their production for make-up gas purposes.

IN PIPELINE MICROWAVE
ONLY THE BEST WILL DO...

PIPELINERS WHO KNOW CHOOSE PHILCO!



Philco Microwave Delivers Outstanding System Reliability, Economy of Installation and Operation, Simplified Equipment Maintenance!

Philco microwave is proving itself in a growing number of pipeline applications. With 240 channel baseband capacity for telephone, telemetering and remote control—including reserve capacity for high-speed computer data transmission—Philco microwave fills both immediate and long-range requirements of modern pipeliners.

Semiconductor rectifiers replace conventional tubes in the new Philco heavy duty tubeless power supplies, assuring minimum maintenance and significant reductions in operating costs. Printed wiring panels increase circuit stability, simplify field maintenance. Klystrons are cooled by convection—compact heat sinks eliminate the need for bulky blowers.

Here is reliability of performance unaffected by severe weather, free from the many limitations of wire and pole line construction, unhampered by problems of difficult terrain, over-water transmission or expensive rights-of-way.

Philco engineers will be happy to help with your special microwave requirements. Please contact us for further information. Look ahead . . . and you'll choose PHILCO.

PHILCO®

Government & Industrial Division
Philadelphia 44, Pennsylvania
In Canada: Philco Corporation of Canada Limited, Don Mills, Ontario

Lively Innisfail Sparks Alberta

Another big productive area is rapidly developing in central Alberta. It's the newly designated Innisfail Devonian field, 60 mi. north of Calgary.

The Innisfail area received official classification as a new oil field Nov. 1, by order of the Alberta Oil & Gas Conservation Board.

The ruling followed announcement of the latest discovery in the area, bringing to five the number of wells finding production from the Devonian.

Official designation as a field in Alberta requires five wells producing from the same formation. Five wells had been producing in the area before the latest discovery, but one of these was not completed in the Devonian.

Several companies are pushing drilling activity—so fast that the area ranked second only to the Pembina-Keystone region in development activity early this month.

The rapid development has been sparked by a fast payout, good market outlets, and good prices.

The allowables start at 600 b/d, and ease down to 450 b/d. Depending on market demand, this "bonus" allowable could be equivalent to a week's production when allowable are cut back to normal.

This allowable will be dropped sharply, however, now that the field has been formally classified. If market demand is 400,000 b/d, for example, the wells will be cut back to around 132 b/d.

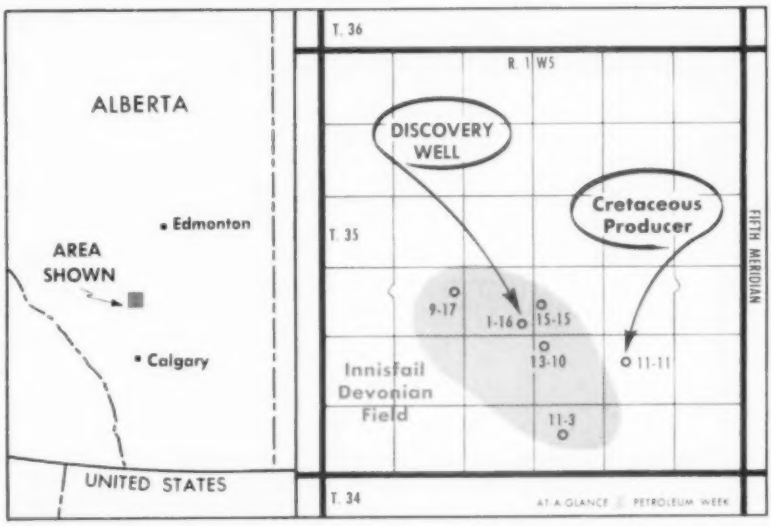
The 42-gravity crude has been selling for $2.39½ a bbl.

Another reason for the brisk activity: The companies want to be armed with knowledge when bidding for lands in upcoming lease sales.

Results of the latest discovery, for example, had been held back pending the outcome of the Oct. 16 sale.

Several companies increased their holdings in the area at that sale, as follows:

- Imperial Oil Ltd. paid $48,511 for 32 acres in crown reserve 1,474, section 18-34-1w5;
- Canadian Oil Companies, Calgary & Edmonton Corp., and Security Freehold Petroleums, Ltd., paid $237,830 for 160 acres in crown reserve 1,475, section 28-34-1w5;
- French Petroleum paid $24,555 for 160 acres in crown reserve 1,476, section 30-34-1w5;
- Cree Oil et al., Canadian Oils, C&E, and Security Freehold paid $380,870 for 320 acres in crown reserve 1,477, section 20-35-1w5;



INNISFAIL AREA, just designated a field, is developing into one of the hottest spots in Central Alberta. Five wells are now producing from the Devonian.

- W. E. Bakke et al. paid $4,230 for 160 acres in crown reserve 1,478, section 32-35-1w5, and $1,600 for 160 acres in crown reserve 1,479, section 6-36-1w5;
- Super West Petroleum paid $5,100 for 320 acres in crown reserve 1,481, section 36-35-2w5.

The five wells completed in the D-3 Devonian have found an estimated 50-million bbl. of reserves, according to various company geologists.

Areal extent of the new field hasn't been defined as yet, of course. This shouldn't take long, however, in view of the pace being set in the area.

Twelve tests were being drilled in the area in late October, compared with 18 at Pembina-Keystone.

One company official says: "With oil pay thicknesses four times those of the Leduc field, and one and a half times those found in Redwater, the newly discovered Innisfail field may well prove more prolific than either when fully developed.

"Although one dry hole on the eastern side of the field (½ mi. east of the discovery) has found the reef water-bearing, there are no tests in the remaining direction within 10 mi. which either prove or disprove the presence of the reef.

"Regardless of the ultimate size of the field, it is apparent that the discovery is of some magnitude."

The drilling rush to the area began after Canadian Oil Companies, Ltd., et al., announced last summer that White Rose-C&E No. 1 Innisfail, lsd 1-16-35-1w5, had come in as a "significant" Devonian reef discovery.

Prior to this discovery, the area was considered mainly a good prospect for gas, and only a marginal oil sector.

Continued seismic shooting several years ago, however, brought minor anomalies to light. This made it seem worthwhile to test the Devonian at nearly 9,000 ft., though chances for finding the Devonian reef appeared slight.

One oil company official commented at that time—the winter of 1953—that "this area of Alberta is not considered too promising for oil possibilities."

Canadian Oils proceeded with drilling operations despite the so-so outlook. In its first drilling effort, the principal objective—the D-3 reef—was water-bearing at 8,700 ft. The well was plugged back to the Cretaceous, where oil possibilities had been indicated at about 6,800 ft. The well was completed in the Cretaceous for 400 b/d.

The second venture ended as a dry hole.

Success came in late August, this year, with the third drilling effort, about 1½ mi. west and north of the Cretaceous producer.

Canadian drilled the discovery in association with C&E and Security Freehold. The D-3 was topped at 8,440 ft. A pay zone of 148 ft. of oil-bearing reef was found, the company reported (compared with an av-

Aggressive drilling research

—another reason why you can look to Hughes for constantly improved bit performance

Every major improvement made to date in cone-type bits can be traced directly to Hughes Tool Company's continuing drilling research—spanning nearly half a century.

Step into the block-long Hughes research and engineering laboratory today and you'll find more men and equipment engaged in drilling research than ever before.

Go into the field and you'll find a greatly augmented staff of engineers gathering facts about bit performance to be relayed to the research laboratory for analysis and final evaluation.

Out of the millions of dollars being spent annually by Hughes in research are coming constantly improved bits to help you make hole faster and more economically.

Your most versatile replaceable tool joint

"Seal-Grip" tool joints assure uniformity of fit on initial and replacement installations because all mating surfaces — the *outer seal, pipe threads* and *inner seal*—are on the same taper.

This means that whether you install new "Seal-Grip" joints on new or old pipe, or old joints on new or old pipe, you get a safe, sure tool joint-to-pipe connection every time.

*A Hughes extra! The new method of cold-rolling the large land area of "Seal-Grip" drill pipe at the mill — developed by Hughes — greatly strengthens this critical area.

When you specify "Seal-Grip," you get the *strongest* and most *versatile* field replaceable tool joint assembly you can buy!

HARDFACING IN DEPTH — a development of Hughes — is also available on "Seal-Grip" joints.

SEAL GRIP®

A DEVELOPMENT OF

HUGHES

TOOL COMPANY

HOUSTON, TEXAS

erage pay of 28 ft. at Leduc and 100 ft. at Redwater).

White Rose-C&E No. 1-16 Innisfail now is producing its allowable of 600 b/d.

Other discoveries followed in quick order. Completions through early November include:

- White Rose (Canadian Oil)-C&E No. 11-3 Innisfail, lsd 11-3-35-1w5, which found 143 ft. of oil pay at 8,519-732 ft.
- Canadian Superior No. 5-15 Innisfail, lsd 5-15-35-1w5, with about 100 ft. of oil pay at 8,454-580 ft.
- Hudson's Bay-White Rose-C&E No. 13-10 Innisfail, lsd 13-10-35-1w5, with 143 ft. of oil pay at 8,424-548 ft.
- Dernick-Guyer Inc. No. 9-17 Innisfail, lsd 9-17-35-1w5, the latest discovery, gave up 760 ft. of gassified oil from 73 ft. of D-3 oil pay, topped at 8,497 ft. The D-2, which was topped at 8,261 ft., yielded 750 ft. of gassified oil and 195 ft. of gas-cut mud, on test.

There also has been one dry hole in recent weeks: White Rose-C&E No. 1-3 Innisfail, lsd 1-3-35-1w5, about ½ mi. southeast of White Rose-C&E No. 11-3.

Officials of Canadian Oil Companies, Ltd., say the company will keep three rigs drilling in the area continuously.

The number of wells ultimately to be drilled depends on how the program shapes up from well to well.

"It will take a little over a year for three rigs to shape up what we consider present proven and probable locations," one official says.

Production of crude from the field is now being brought to Calgary for marketing to British American Oil Co., Ltd.

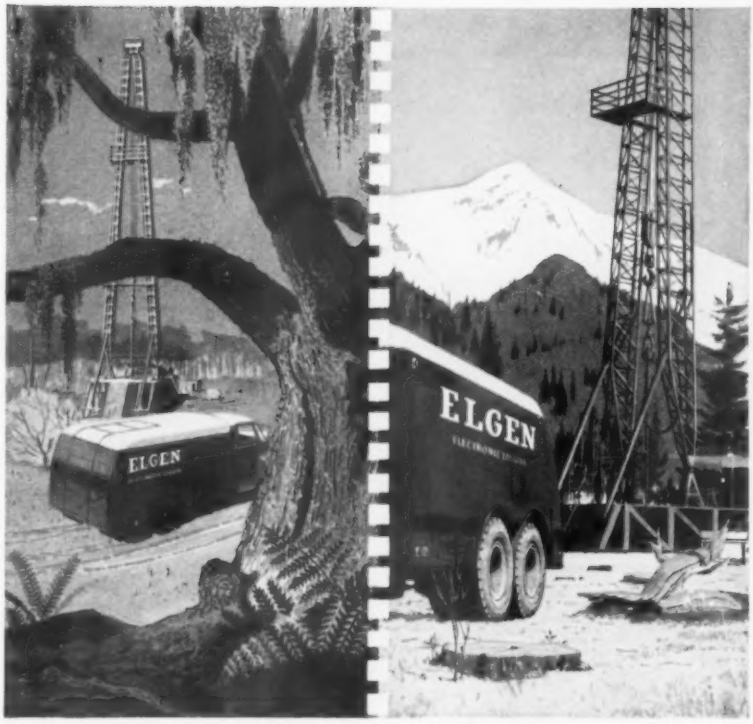
British American's refinery at Calgary has a crude capacity of 7,200 b/d.

The first pipeline outlet for the field is just about ready.

Rangeland Pipeline Co., a subsidiary of Hudson's Bay Oil & Gas Co., Ltd., is building a 19-mi., 8-in. spur into the area.

The line was scheduled for completion around Nov. 1, but snow hit hard, holding up almost a mile of connecting link before it could be coated and buried. The job was expected to be completed by mid-November, provided some new difficulty didn't arise.

Lateral lines run about 4 mi. The main line, costing about $270,000, intersects existing facilities leading to the Edmonton terminal of the Trans-Mountain and Interprovincial pipelines.



GULF COAST to the ROCKIES...

ELGEN takes them all!

There's a world of difference in formation and terrain characteristics between these two scenes. And a world of difference in equipment and technique needed to give you accurate logging and log analysis. Elgen knows this, and has designed its specialized equipment, and trained Elgeneers and crews to meet the particular needs of specific oil areas. When the familiar Elgen green truck stops to service your well, you know the most accurate services are yours.

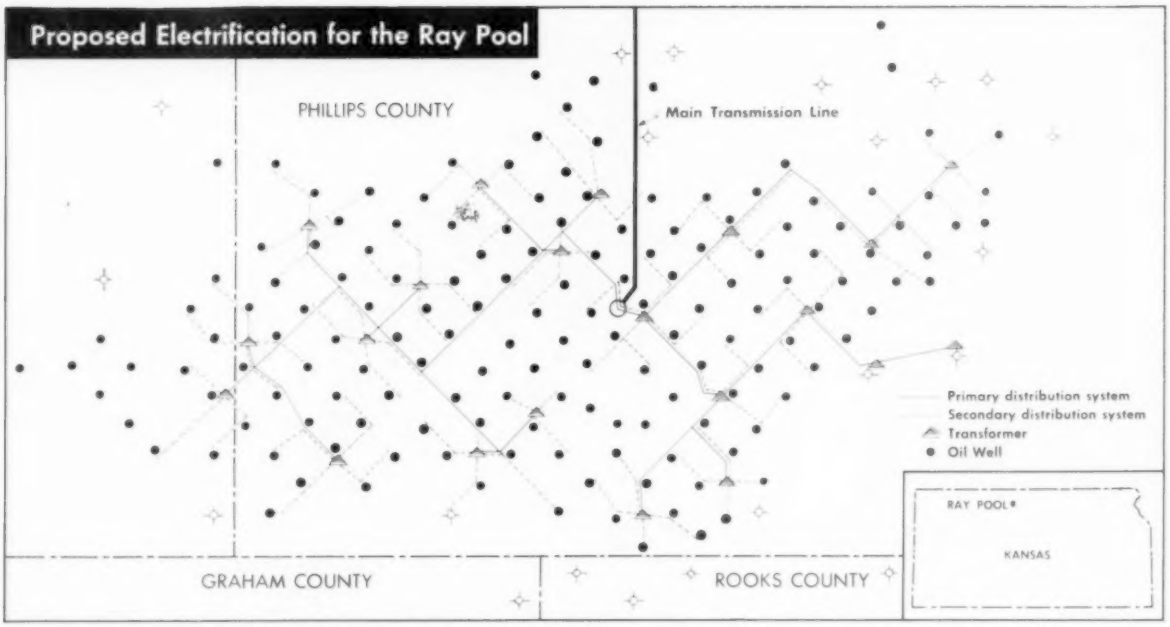
ELGEN services:

electronic logging	perforating	collar locator
permalogging	differential temperature logging	depth determination
hole caliper	geophone service	depth scales, 1", 2", 5", 10", 25"
sidewall coring	conductivity logging	
nuclear logging	limestone curve	quantitative reports

Elgen offices are located in major oil areas... call or write today for complete information on Elgen well logging, coring and perforating advantages.

THE ELGEN CORPORATION

2925 MERRELL ROAD / DALLAS, TEXAS
FLeetwood 7-3958



TRANSMISSION LINE will bring electricity to wells in the Ray pool, Kansas. In the move to electrification, this . . .

Kansas Pool Will Buy Power

Cities Service Oil Co. is taking another step in its move to electrify all producing properties where practical: It is electrifying its production facilities in the Ray pool, Phillips and Norton Counties, Kan.

The company is one of many in the Mid-Continent region that are joining a fast-growing trend to electrification of oil-producing properties, and use of purchased electric power.

An $80,000 installation contract has been awarded by Cities Service to C. & P. Electrical Contractors, Great Bend, Kan.

Work on installing the facilities is now getting under way. Completion date is set for Jan. 1, 1958.

A total of 145 electric motors will be installed in the Ray pool. These include 139 oil well installations, and six salt-water disposal pumps to handle brine for two salt-water disposal wells.

Western Light & Telephone Co. will supply the electric power. Power costs will run about $43,000 per year, according to Cities Service.

Cities Service told PETROLEUM WEEK that Western will supply 33,-200-volt facilities for the operation. Cities Service will operate a 13,200-volt primary distribution system, with a 440-volt, three-phase, secondary distribution system. C. & P. will handle the installation of these facilities.

All electrical transmission conductors will be of the "No. 2 ACSR" specification, and transformer banks scattered through the pool will be predominantly 3-25 kva. All wells will be equipped with overload, lightning, and single-phase protection; automatic restarts, and the time-clock controllers.

Wires will have a clearance of 70 ft. above each well head, and 100 ft. above tank batteries.

The basic-sediment and burning pits will be serviced by all-above-ground electrical wires, while motor power and control service will be through underground conduit.

Cities Service engineers designed all components of the electrical-distribution system.

Required well prime movers will be from 3 to 10 hp., with the majority being 5 to 7½ hp. The salt-water injection pumps will be powered by 3 to 75 hp. motors.

Cities Service says it favors electrification of its producing properties because of the savings to be gained in maintenance and other means over a long period.

The company expects to save at least $56,000 per year by electrification of the Ray pool.

For example, the cost of generator maintenance on the present gas-engine system in the Ray pool has been running about $9,050 per year. Maintenance of the gas engines themselves has been costing about $13,200 per year.

Cities Service has previously operated 31 electrified wells in the Ray pool, generating its own power. The electric motor maintenance on these wells has been running about $1,500 per year.

This type of expense will be increased to about $6,600 annually with installation of all-electric operation, but a big saving on fuel-gas expenses is expected to offset this.

For example, annual fuel-gas expenses in the Ray pool have been about $57,000 per year. (The company buys all its gas locally.) This will drop to about $14,000 when the electrical facilties are installed.

Electrical energy will cost roughly $43,000 annually. But about $3,300 in lubricating oil expense, required on gas-engine maintenance, will be completely eliminated.

In the electrification system (map), primary and secondary transmission systems will use the same poles, cutting down on over-all cost of the installation.

From the major transmission line, near the center of the pool, the primary system hooks up the transformer banks. From the transformer banks—which receive a high voltage—usable amounts of current are sent through the secondary systems to power facilities at each well.

The Ray pool was discovered by Cities Service in July, 1940, with the completion of No. A-1 Ray. The field

Here's how to get more for your money in lease production equipment

It is now possible to combine separating and metering in one vessel — for very little more than the cost of a separator alone. ROLOCHECK Metering Separators not only separate oil and gas efficiently, they accurately meter the oil as well.

Use ROLOCHECK Metering Separators as:

Test Separators — Automatically separate and meter a well's production on test, enabling tested well's production to be recombined into bulk line to storage. Eliminate test tank and manual test tank gauging.

Individual Well Separators — Continuously separate *and meter* production from each well, allowing common field gathering lines and savings in flow lines, tankage and labor. In addition, obtain valuable *continuous* production records.

ROLOCHECK Metering Separators are available in two types:

Two-Phase Unit separates oil and gas, metering total liquid. Meter is a genuine ROLOCHECK, designed for and *proven* in oil field service. Meter alternately fills with a calibrated volume of liquid from the separator section, then discharges this volume to storage. Metered volumes are totalized on a counter.

Three-Phase Unit separates oil, water and gas, and meters both oil and free water by means of two ROLOCHECK Meters built right in the vessel. Water can be discharged to disposal after metering.

Features:

Rolo Neutral Position 3-Way Meter Valves . . . assure maximum meter accuracy with no slippage.

Efficient separation using monel mesh mist extractors.

All sizes and working pressures are available.

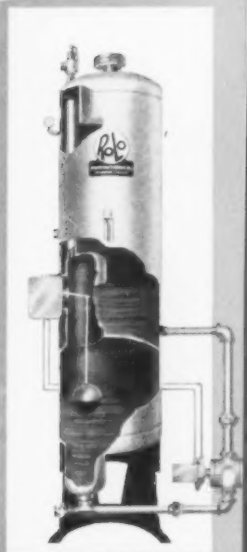
Optional Accessories:

Rolo Automatic Sampler obtains and collects samples from oil meter so that water percentage can be determined.

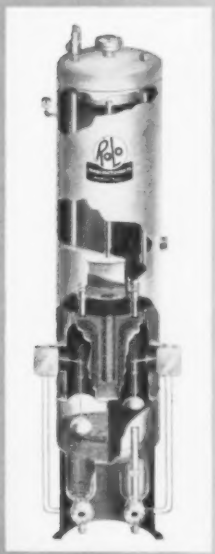
Completely piped gas lines with orifice fittings, gas meters, etc.

Special internal coatings to inhibit paraffin deposits.

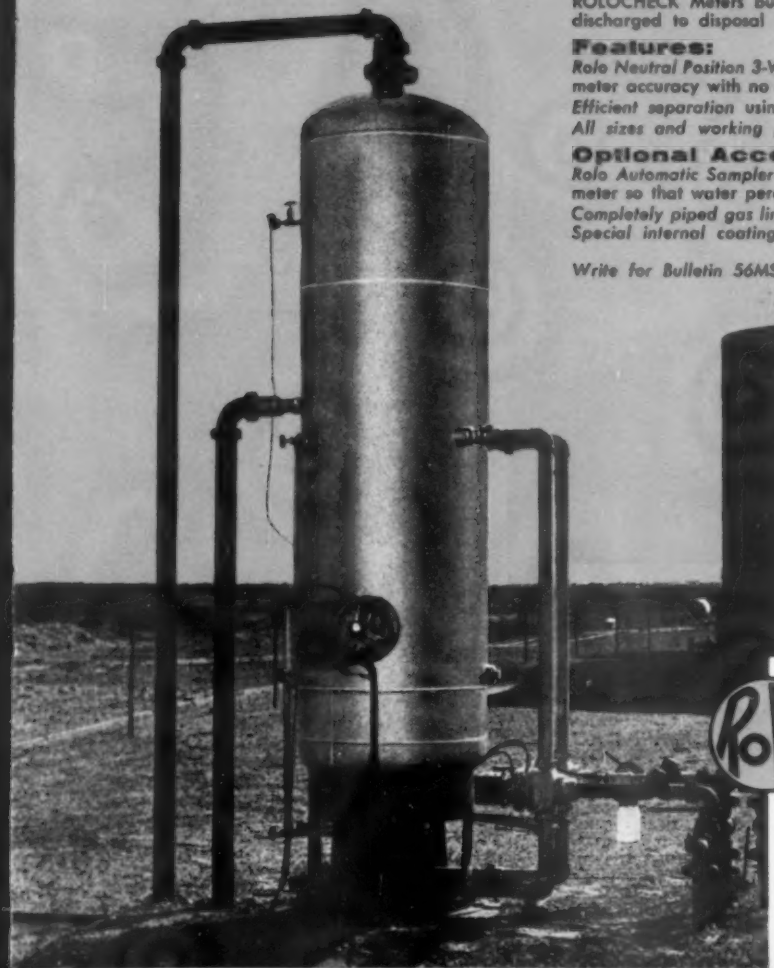
Write for Bulletin 56MS, or see your nearest representative.



ROLOCHECK TWO-PHASE METERING SEPARATOR



ROLOCHECK THREE-PHASE METERING SEPARATOR



ROLO MANUFACTURING COMPANY

P. O. Box 6763 Houston 5, Texas

Midland, Abilene, Wichita Falls, Corpus Christi, Kilgore, New Orleans, Lafayette, San Pedro, Ventura, Bakersfield, Denver, Durango (Colo.), Tulsa, Mt. Vernon (Ill.), Mexico City. EXPORT: R. S. Stokvis & Sons, Inc., 17 Battery Pl., N. Y. C. CANADA: Petro-Automation Ind., Ltd., Box 72, Edmonton. VENEZUELA: PETICON, Caracas, Maracaibo, Anaco.

has produced 19.3-million bbl. of oil so far.

Production comes from both the Arbuckle lime and the Reagan sand. Average producing depth is about 3,600 ft. Kaw Pipe Line Co. takes the 31-gravity oil, which commands a price of $2.86 per bbl.

Present field production runs from 20,000 b/d to 25,000 b/d, plus about 55,000 bbl. per week of salt water.

Cities Service estimates the pool's reserves at 4.2-million bbl., as of Jan. 1, 1956. It is currently engaged in a development program in the field, and has drilled about eight tests so far this year.

Cities Service is one of the largest boosters of oil-field electrification, with some 2,000 wells now on electric operation throughout the country. That's an increase of some 400% since 1950.

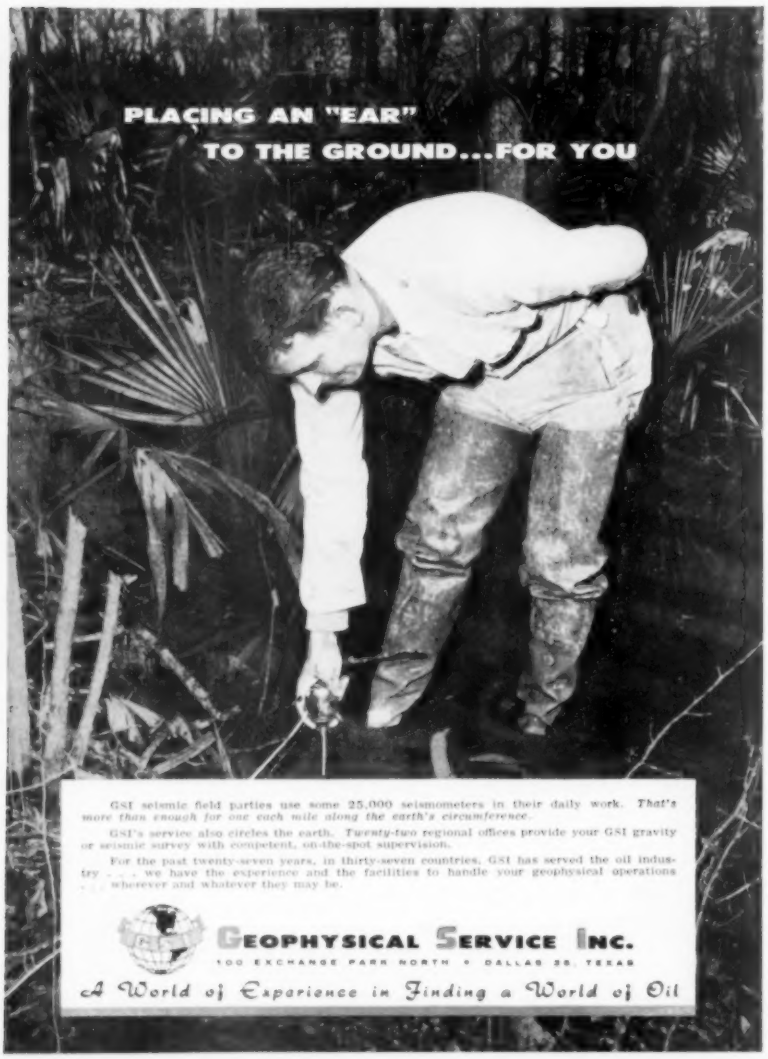
During the past two years alone, it has installed more than 1,000 motors, costing about $1.2-million.

The company's electric installations in oil fields totaled 10,163 hp. in 1955. Today that has almost doubled—to 17,790 hp.—despite the fact that the per-well horsepower requirement has been cut.

The company estimates that about 20% of all its wells are now operated by purchased electric power.

Cities Service is also a big user of electric facilities in the Panhandle field of Texas.

In this area, exacting specifications for electrical equipment have paid off for the company. In a late spring blizzard, the company lost only two motors out of 243 operating in the field due to burn-outs. The industry as a whole lost more than 1,000 in the region. All motors operated by the company are doubly insulated against snow and dampness.


PLACING AN "EAR"
TO THE GROUND...FOR YOU
GSI seismic field parties use some 25,000 seismometers in their daily work. That's more than enough for one each mile along the earth's circumference.
GSI's service also circles the earth. Twenty-two regional offices provide your GSI gravity or seismic survey with competent, on-the-spot supervision.
For the past twenty-seven years, in thirty-seven countries, GSI has served the oil industry . . . we have the experience and the facilities to handle your geophysical operations . . . wherever and whatever they may be.
GEOPHYSICAL SERVICE INC.
100 EXCHANGE PARK NORTH • DALLAS 35, TEXAS
A World of Experience in Finding a World of Oil

Eldorado Field Gets ACT Units

Two automatic custody transfer systems are now being installed by Cities Service Oil Co. in the old Eldorado field in Kansas.

The company has just begun putting in the automatic equipment on two leases, the Hegberg and the Koogler, both in Butler County.

The two ACT systems will go into operation around Jan. 1, 1958, handling oil from a total of 327 wells.

Provision is being made for possible increased production in the future.

On the Hegberg lease, initial production will be about 1,300 b/d of oil, but the system will be able to handle up to 2,000 b/d. On the Koogler lease, initial production will be about 1,100 b/d, but the system will be able to handle up to 2,000 b/d.

Cities Service hopes to pay for the two ACT installations through reclamation of old storage tanks on its Eldorado leases.

The company will reclaim seven tanks from the Hegberg lease, and 19 from the Koogler lease.

When the ACT systems go into operation, eight tanks will be used on the Hegberg lease, and 14 on the Koogler lease. Other tanks now in place on the lease will be used in other parts of the field.

Positive-displacement meters will measure the oil automatically.

The ACT setups will provide for automatic tank switching. If oil handled through a specially-designed monitor does not meet specifications, it will be chemically treated and diverted through a standby heater-treated.

When the oil meets specifications, the ACT system will divert the clean oil to the sump tank for delivery to the pipeline.

All instruments and controls will be mounted on unitized skids.

Cities Service says that its old Eldorado field—a pioneer testing ground for production improvements—may see more ACT installations in the future.

Since its discovery by Cities Service in 1915, the field has seen just about every kind of production and technological development. For example, it served as a proving ground for the use of corrosion inhibitors.

The field has more than 1,800 wells on some 25,000 acres.

The company says there are many leases in the field that could be adapted to ACT operation in the future.

The nearest thing to seamless tubing!

SOUTHERN PIPE

high frequency resistance welded steel pipe

Southern's light weight, high strength steel pipe offers *real savings*. The longer the line, the greater the economies. You save in ease of handling, require fewer joints, fewer loads and lighter field equipment. Installation costs are susbtantially reduced because of longer lengths. In addition to *all* these advantages, Southern's revolutionary high frequency, resistance welded steel pipe with normalized weld zone has no interior or exterior bead—assuring holiday-free coatings whether field or mill-applied.

Available in a wide selection of thicknesses, diameters, and lengths. Get the full story of Southern's welded steel pipe—write, wire or call

No weld beads!

Facilitates Field Wrapping

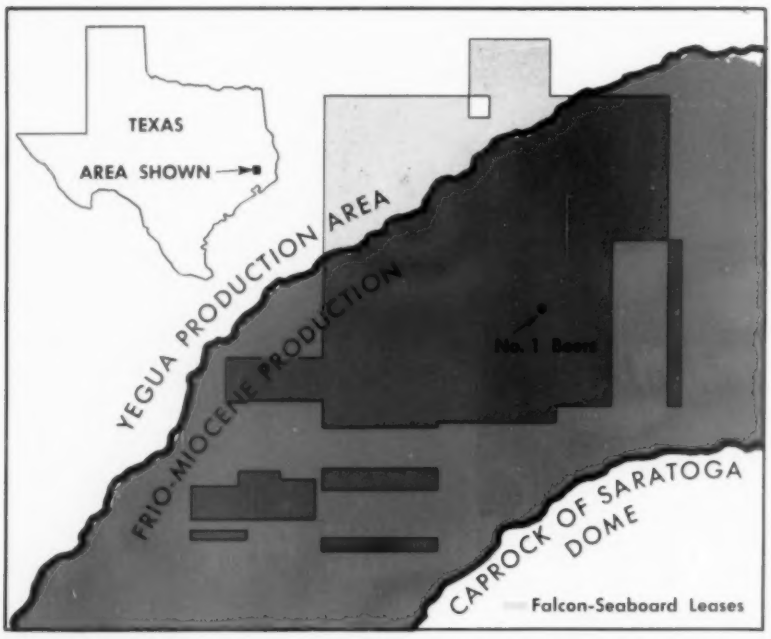
Southern Pipe & Casing Co.

DIVISION OF U.S. INDUSTRIES, INC. USI

P.O. BOX C • AZUSA, CALIFORNIA

OFFICE AND PLANT:
ARROW HIGHWAY AT IRWINDALE AVENUE • TELEPHONE CUMBERLAND 3-8302 • EDGEWOOD 7-1221

© 1957, U.S. Industry, Inc.



SARATOGA DOME has had its ups and downs, oilwise, for 50 years. Now, there's . . .

New Life for Texas Dome

Look for a continuation of the quiet, year-long boom that has developed at the old Saratoga salt dome field in Hardin County, Texas Gulf Coast region.

The field has had about five or six booms in its long history. (The first well was completed in 1903, which makes it one of the oldest producing sections along the Gulf Coast.)

Each of the preceding booms followed the discovery of oil in new areas on the caprock, or around the outer flanks of the area.

The latest boom was touched off by Falcon-Seaboard Drilling Co. in August, 1956. The discovery sparked a Frio-Miocene play that is still going strong on the north and northwest flanks of the dome.

Falcon-Seaboard's success came so swiftly and quietly that little was heard of it outside the local area.

The discovery—No. 1 Beers—was completed for 65 b/d from the Miocene, topped at 3,245 ft. This well is still producing at that rate—its allowable (salt dome production is not subject to shutdown days).

The Miocene discovery was significant because it confirmed geological thinking that oil would be found between the old caprock production, which is shallow, and the Yegua sand production, which is deeper and about a mile or more from caprock limits.

T. N. Law, Falcon-Seaboard's president, says the Frio is the most prolific producing horizon under the company holding.

The Miocene sand varies greatly in thickness, but one of the best producers so far is flowing from a 10-ft. sand.

Good production possibilities are seen likely on the west and southwest flanks, but only the northern flank is involved in the current drilling play.

Falcon-Seaboard has completed 23 oil wells (five of them dual producers) on its 400-acre tract, and more projects are planned. There have been three dry holes.

Three of the producers had to be sidetracked in order to hit pay zones. Net pay of all sands totals 1,225 ft.

The dry holes apparently have defined the Frio and Miocene sand series on the east and west sides.

Production from the 23 wells comes from four Frio and five Miocene sands, ranging in depth from around 2,600 ft. to 3,750 ft.

Daily average production is now 1,600 bbl, of which about 900 b/d is from the Frio sand series.

The Saratoga dome's productive sands are highly faulted, wedging out updip against the salt.

So, Falcon-Seaboard says, the company is "feeling as it goes" gradually away from the caprock productive limits, a little at a time, hoping to pick up deeper sands as it ventures on out to the Yegua productive limits.

The company plans to prove up as many deep pays as it can, produce them, and then plug back up the hole until each sand reservoir is depleted.

"There's enough drilling to keep one rig constantly busy," a company official reports.

The objective of the expanded drilling program is to find deeper Frio and Miocene sands—from around 4,300 ft. to 7,300 ft.

Though the boom has been largely a one-company affair, several other companies are also drilling for Frio and Miocene production along this dome flank.

These include The Texas Co. and Harlan Ray, an independent. Between them, they have drilled about 15 wells.

One Texaco well is dually completed, and is making its allowable of 265 b/d.

Only one major production problem — sandups — is encountered in completing the Frio-Miocene wells.

Unconsolidated sands must be packed with coarser sand through a slotted liner.

Just enough pressure has to be applied to the wellhead to force the coarse sand into the unconsolidated sands, to prevent sandups, without fracturing the formation.

After each well is drilled, and the sand packing applied, 7-in. or 5½-in. casing is run through the lowest productive zone and perforated.

Normal bottom-hole pressure is about 1,800 psi. No appreciable gas has been found, the wells being of fairly low gas-oil ratio. It is believed the wells are solution-gas drive, with a possible water drive on some of them. About 60% of the wells are flowing.

Alcorn, King, and a company geologist checked logs of wells drilled in the area, and concluded Hicks could be right. The company began blocking up acreage, finally closing up 400 acres. Drilling began at No. 1 Beers. The rest is history.

There is another story behind the story of the boom. It involves the firm belief Falcon-Seaboard's Jimmy Hicks, the company's field superintendent at Saratoga, has long held about the productive possibilities between caprock and Yegua production.

Hicks had worked in the Saratoga field in the early years of the field's development. When Hicks joined Falcon-Seaboard, he persisted in selling the idea to W. H. King, assistant to Charles Alcorn, executive vice-president.

Texasteel SUCKER RODS AND LIBERTY PUMPING UNITS

Excellent Products of Liberty Craftsmanship and Engineering

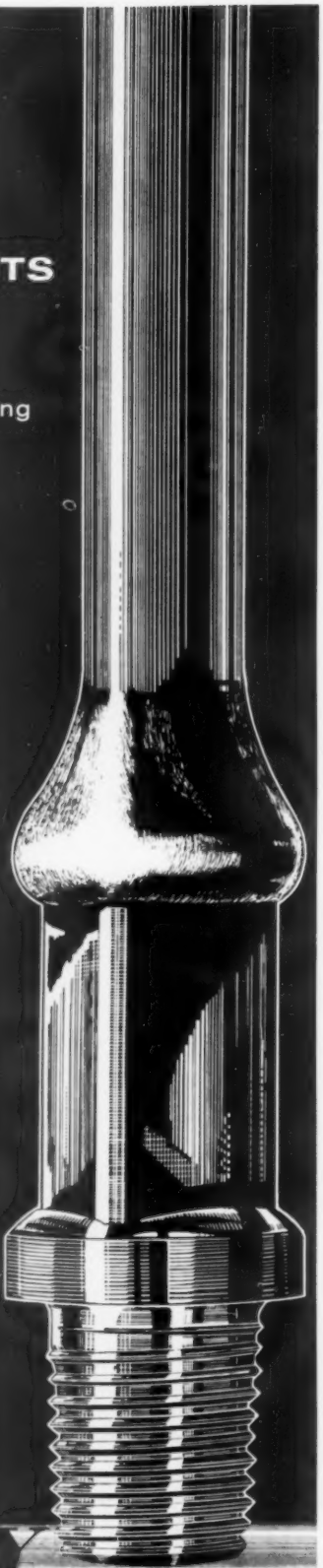
THE FINAL PROOF . . .
of quality in a product is found in how well it performs.

PROVE TO YOURSELF . . .
the excellence of TEXASTEEL SUCKER RODS and LIBERTY PUMPING UNITS. Try them on *your* next well and discover their outstanding performance.

TEXASTEEL SUCKER RODS . . .
are readily available for rapid delivery from eighteen strategically-located field warehouse stocks in major producing areas.

LIBERTY PUMPING UNITS . . .
are also available at many of these field warehouses.

LIBERTY PRODUCTS . . .
are sold through supply stores only. For additional information, please contact your local supply store.

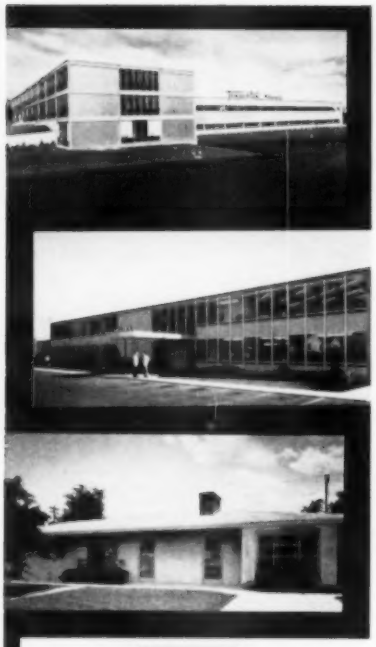


ENGINEERED EXCELLENCE

LIBERTY

MANUFACTURING COMPANY

4025 Hemphill Street • Fort Worth, Texas



3
convenient
locations
1
source for...

Nuclear Instruments
Radiochemicals
Consulting Services
Reactor Monitoring Services
Oil Field Tracers
Decontamination Services
Radiation Research Equipment

Write for booklet "W"

Tracerlab
KELEKET

Tracerlab

1601 Trapelo Road, Waltham, Mass.
2030 Wright Avenue, Richmond, Calif.
2419 South Boulevard, Houston, Texas

Oil's Nuclear Uses Grow

The growing uses and importance of radioactive materials in petroleum exploration and production were pointed up last week at a symposium in Houston.

The three-day meeting was sponsored by Tracerlab, Inc., a Boston firm that has pioneered in peaceful uses of the atom.

The symposium on application of radioactivity in petroleum exploration and production was the second of two Tracerlab meetings devoted to the oil industry. The first one, held in Boston last year, covered applications of radioactivity in petroleum research and refinery operations.

One speaker cited a recent Atomic Energy Commission survey that indicates use of radioisotopes is saving industry about $390-million annually.

Paul C. Aebersold, of AEC's Division of Civilian Application, said that, as of July 31, 1957, a total of 4,182 organizations, including 1,667 industrial users, were licensed to possess and use byproduct radioisotopes.

Aebersold added that the petroleum industry leads in the industrial use of isotopes—a major, if not the most important, peaceful use of the atom.

Though a further breakdown of petroleum industry uses was not given, it's been generally recognized that the research and processing segments of the industry have for some time made wide use of radioisotopes (see Special Report, page 99).

Use of radioactive materials is picking up in the production segment, however, as indicated by the symposium.

Aebersold added: "Radioisotopes are the single area of the atomic energy program now yielding a good dollar return to U. S. industry."

The use of radioisotopes to determine liquid saturation in porous strata—an important point in waste disposal—was discussed by Leonard B. Lipson, associate professor of Petroleum Engineering, University of Houston.

Lipson's report, made in conjunction with L. S. Gournay, of Magnolia Petroleum Co., described laboratory experiments in which radiocobalt tracers were used.

Using the Woodbine sand as an example, Lipson presented calculations showing just how much cobalt, for instance, could be absorbed. Not only are the wastes distributed among the pore spaces in the rock, he said, but also on the face of the rock itself.

Lipson said that the amount of radioactive wastes that can be held by formation rock increases as the content of clay in the rock increases.

F. E. Armstrong, of the U. S. Bureau of Mines' Petroleum Division, described a transistor-operated probe for gamma-ray logging.

The instrument, says Armstrong, is completely self-contained, shock resistant, and capable of continuous operation for a period of 250 hours on one set of batteries.

The probe will operate, he says, at depths to 5,000 ft. under hydrostatic pressures of 2,000 psi., and temperatures between 70F and 130F.

Outside diameter of the probe is 1 in., which permits its use in wells completed with pipe as small as 1½-in. cement-lined tubing.

The use of radioactive tracers in waterfloods and fracturing was the subject of several papers. In one of these reports, a four-man team listed various uses of such tracers in waterflooded reservoirs.

J. W. Watkins, F. E. Armstrong, and R. J. Heemstra, all of the Bureau of Mines, and E. S. Mardock, of Well Surveys, Inc., said gamma-emitting radioactive isotopes have been used to advantage in solving problems caused by different conditions in waterflooded reservoirs.

Tracers may be useful, they noted, when the injected water passes between wells through the natural pores of rock formations, or through fracture systems—naturally or artificially created—within the productive formations.

From these uses of tracers, information can be obtained on (1) vertical comparisons of points of exit of water from input wells (input profiles), (2) rates of travel and comparative horizontal distribution of injected water between wells, and (3) vertical comparison of points of entry of water.

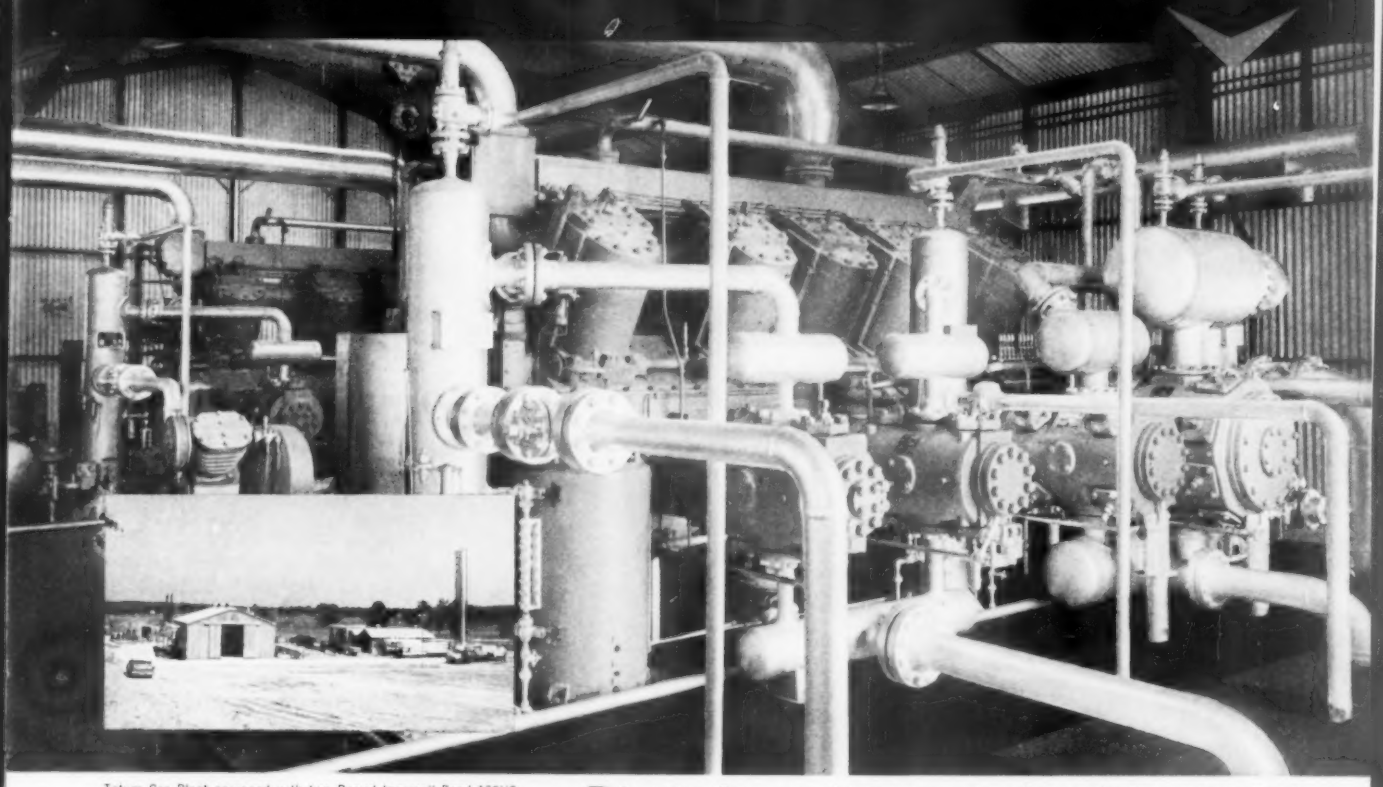
John C. Dempsey, of Birdwell, Inc., reported on the uses of various radioactive isotopes to locate zones affected by hydraulic fracturing.

Dempsey said that more than one radioisotope can be used in the same job to determine the time sequence of fractures.

Experience has proved, he added, that the information supplied by these radioactive surveys is invaluable in determining the cause of fracture failure.

Knowledge of the location and vertical extent of the fracture of the

BEAIRD-INGERSOLL-RAND Packaged Compressor Plant



Tatum Gas Plant equipped with two Beaird-Ingersoll-Rand 10SVG 550 h.p. packaged compressors. Units are complete with all necessary controls for unattended operation. Other sizes from 120 to 660 h.p.

Packaged Compressor Equipped . . .

GAS PROCESSING BOOSTS FIELD ALLOWABLES

Robert Cargill, operates this gas processing plant in the Tatum-Petit Field. Located just outside the city limits of Tatum, Texas, the field has grown from a single wildcat to 75 producing wells in less than three years. During this swift expansion it became evident that the increasing number of high gas-oil ratio wells would curtail oil production unless a means was provided to conserve the excess gas. An additional problem was created by the wide variation of wellhead pressures which ranged from 25 psig. to 650 psig.

Engineers called in by Robert Cargill solved the production problem by designing a gas processing plant to remove heavy elements as marketable by-products and to boost the dry gas to a nearby sales line. Two Beaird-Ingersoll-Rand 10SVG 550 horsepower packaged compressors were selected for the main station. Each compressor has been engineered to handle both low and high pressure streams. Low pressure gas is boosted through three compression stages then tied into the discharge of the fourth cylinder which boosts the high pressure stream. The plant can process 20 mmcfd. at 850 to 1,000 psig. discharge with its present arrangement.

As future requirements demand, additional packaged units may be economically installed to handle the increased load. When the field is depleted the compressors may be moved to other service with little or no change in piping or manifolding.

Let us assist you in planning an economical solution to your production problem. Call or write . . .

THE J. B. BEAIRD COMPANY, INC.
Shreveport, Louisiana
A Subsidiary of American Machine & Foundry Company

BEAIRD
another AMF product
PACKAGED COMPRESSOR PLANTS

LOWEST COST PER HORSEPOWER INSTALLED

SHREVEPORT, LOUISIANA. *Sales Offices: Dallas, Houston, Corpus Christi and Midland, Texas • New Orleans, Louisiana • Tulsa, Oklahoma • Denver, Colorado • Los Angeles, California • Caracas, Venezuela • Cie. Ingersoll-Rand, Paris, France.*

well bore after successful jobs has aided operators in planning fracturing programs and improving completion practices.

D. H. Carter, of Halliburton Oil Well Cementing Co., said that radioisotopes are proving useful in secondary recovery and in certain fracture studies.

Carter said the Isoflow survey makes possible the determination of fluid input profiles of injection wells in secondary recovery programs.

In Isoflow logging, he explained, tubing is run to a level below the horizon to be surveyed. Fluid is injected into the well through both the casing and the tubing.

An interface is thus established in the annulus, above which fluid routed through the casing enters the formation.

If a soluble radioactive material is injected into one of the streams, this interface may be located by a small gamma-ray counter.

By varying the ratio of the injection fluid entering the tubing and annulus, the position of the interface can be changed. The position of the interface is a function of the injection ratio and the permeability profile of the borehole.

In fracturing, Carter continued, the "Rayfrac" operation is a process which makes possible the location and interpretation of borehole fractures.

This process normally consists of a method whereby radioactive material is transported to a fracture, channel, or permeable zone, and deposited therein by the fluid motion.

The anomaly is then located and evaluated by comparing a natural gamma log to a post-operation gamma log.

The radioactive material most commonly used in this particular study has been "tagged" sand.

Developments in the field of radioactive logging methods—including borehole accelerators for producing high-energy neutrons—were described by a two-man team from Magnolia.

R. L. Caldwell and R. F. Sippel said that many of the common earth elements of interest to the petroleum geologist can be identified by the gamma rays produced when rocks are bombarded with high-energy neutrons. These measurements can be made with a logging tool, they added, and hence are the basis for radioactive methods of chemical analysis in the borehole.

The two said that "at least" four service companies presently are developing borehole accelerators for producing high-energy neutrons.

Caldwell and Sippel said that other new logging methods are being developed to measure properties other than chemical composition.

The presence of oil could be determined through accurate measurement—by nuclear means—of the relative amounts of hydrogen, carbon, and oxygen in strata, said C. W. Tittle, professor of Nuclear Engineering, Southern Methodist University.

It is possible "in principle," said Tittle, to obtain quantitative analysis of the elemental chemical constituents of the rock by means of radioactivity.

He added that, in certain environments, this is already being done for hydrogen by neutron well logging. Tittle said that accurate measurement of the other two elements as well could determine oil presence.

In carbonate rocks, he continues, the carbon of the solid component might confuse interpretation. But an accurate measurement of oxygen would aid materially, because the oxygen content of solid rock components is surprisingly constant.

Specialized
to serve you better!
From the shot point to you, your seismic surveys are handled by specialized equipment and personnel to provide you with faster, more accurate data.
OEX
GROUP

- **Complete Unified Service** ... management, interpretation, research, maintenance, in fact all modern facilities are concentrated under one roof in our new building.
- **New Accurate Floating Cables** ... with specially designed pressure phones to give increased penetration and more accurate recordings.
- **Magnetic Recordings** ... are available on request for your specialized requirements.
- **Data Reduction** ... to save you time and money, and to give you accurate information.
- **Reynolds Cross-Section Plotter** ... may be used to correlate your sectional data in a hurry.
- **Experienced Crews** ... are now working in both foreign and domestic waters.
- **The Finest Fleet of Seismic Boats** ... modern steel boats, specially designed for offshore seismic exploration.

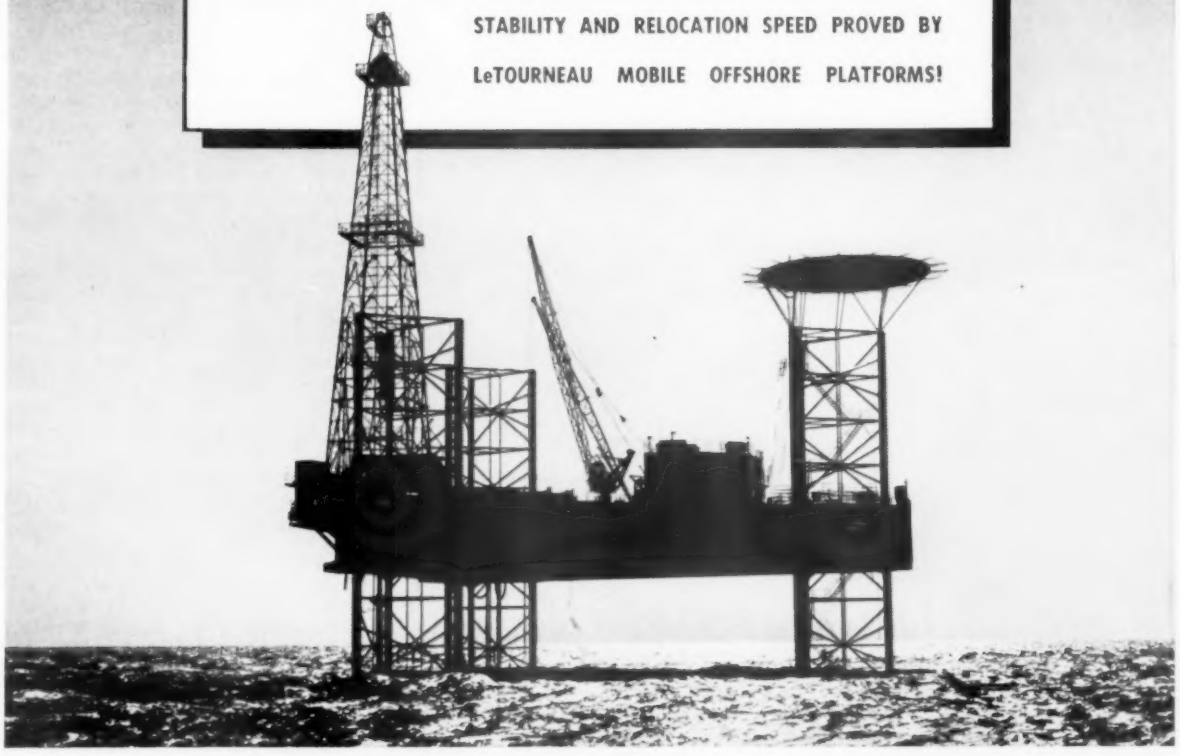
OFFSHORE EXPLORATION GROUP

2711 Timmons Lane • Houston, Texas • Phone MA 3-0481

APTDO 463 • Edificio Republica • Caracas, Venezuela • Tel: 5-6341

PAYOFF!

STABILITY AND RELOCATION SPEED PROVED BY LeTOURNEAU MOBILE OFFSHORE PLATFORMS!



Two great money-saving capabilities have just been demonstrated by LeTourneau Platforms in the Gulf.

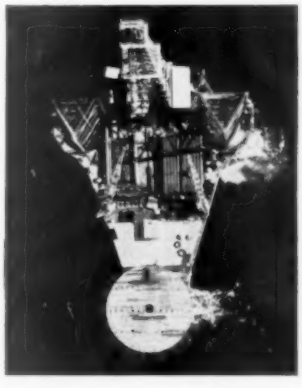
●

Record breaking time for relocation was set by Zapata Offshore Company's "Scorpion," on location off the South Pass of the Mississippi. It was lowered to water, towed one mile to new location, and raised again to 25 feet in just 8½ hours!

Proof of real stability was established by the "Vinegarroon," also owned by Zapata, when it weathered Hurricane Audrey with virtually no damage. Directly in the path of the storm off Cameron, La., the big unit was able to resume operations within hours after a crew could return aboard — becoming first in the area to go back to work.

This is real performance, and these LeTourneau-designed and built platforms will be joined soon by others under construction for such firms as Deepwater Exploration Co., Barnwell Offshore, Inc., Dixilyn Drilling Corporation and Reading & Bates Drilling Co.

Others will be built to meet exact requirements of forward looking companies like yours. Why not summarize your requirements and let us discuss them in confidence with you? Delivery in five to eight months.

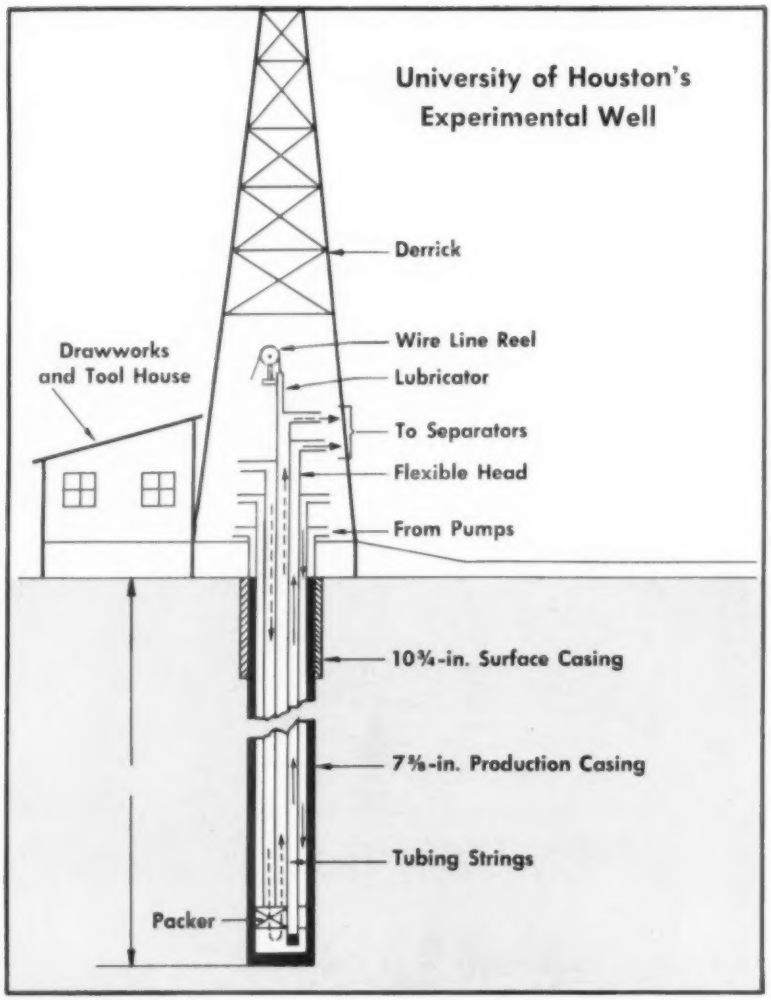


Zapata Offshore Co.'s **Vinegarroon** . . . capable of operating in water 100 feet in depth and drilling to 20,000 feet.

LET
LeTOURNEAU EQUIPMENT

R. G. LeTOURNEAU INC

MARINE PRODUCTS DIVISION • 2851 I SOUTH McARTHUR
LONGVIEW, TEXAS M 108



EXPERIMENTAL WELL (above) will set no records. But research will gain as . . .

Houston Gets Subsurface Lab

A well will be drilled soon in Houston that has success assured from the start.

This well, though it will produce both gas and oil, either together or alone, from one "producing zone" or three, will not be subject to Texas Railroad Commission allowables, and will not sell oil or gas to pipeline systems.

The well will be an intricate experimental well for the University of Houston, to be used in connection with petroleum courses.

Plans for the well are being completed at the University as a result of efforts by members of the petroleum industry.

J. K. Harrell, of Harrell Drilling Co., is ramrodding the project to give the university the world's most intricate "subsurface laboratory."

The well is expected to cost at least $50,000.

Financing for the project is being obtained from donations by the oil and gas industry.

An arrangement with United Gas Pipe Line Co. will provide gas for the well. Gas will be drawn from United's line, used, and then returned to the line.

Crude will be obtained from some of the refineries in the area. Crude may be donated by the refineries.

The system has been designed so that instructors at the university will be able to change the type of well easily to demonstrate the "book-learning" covered by a lecture or lab session.

By a turn of a valve, professors teaching petroleum courses will be able to change the operation from producing crude oil to gas. Another twist will bring an emulsion of oil and salt water.

Petroleum students will have the opportunity to examine and study the operation of many different oil field machines. They will be able to log the well, do comparative evaluation of different logging instruments, and do long core displacement studies. They can study the development of differential pressure gauges for high-pressure operations, and the design of a high-pressure lubricator.

Students will also be able to study in detail:

- Production of low-gravity, high-viscosity crudes, by the application of as lift, heat, and LPG cut.
- Vertical flow characteristics for slug-type lifting for different tubing sizes.
- Optimum producing conditions for small-diameter tubing.
- Developments of optimum producing conditions by artificial lift for two or more zones being produced simultaneously.

Construction of the "lab" will begin Dec. 1, on a site furnished by the university next to the present engineering laboratory. The "lab" site will be ½-acre to 1-acre in size.

The rig will be left on the well after crewmen have drilled it to a total depth of 2,000 ft.

Adequate space is being provided around the well for all the field equipment necessary to operate a producing well. The "subsurface lab" will also have draw works, a tool house, six oil storage tanks, a pumping unit, a storage shed for the compressor discharge unit, and sheds for other compressors, separators, and heaters.

Tentative specifications for the well and equipment have been made. Plans for the well call for:

- Electric log, microlog, and side wall cores to a total depth of 2,000 ft.
- 200 ft. of 10¾-in. surface casing. This will be cemented from the surface to the bottom of the string.
- 2,000 ft. of 7⅝-in. production casing. This will also be cemented from top to bottom.
- A gamma-neutron log. This will run the total depth of the well.
- Production tubing. The well will have 2,000 ft. of 3-in., 2½-in., 2-in., 1½-in., 1-in., and ¾-in. tubing.

Other equipment includes a subsurface pump, gas lift valves, a surface pumping jack, a complete Christmas tree, and everything else necessary to the operation of the laboratory well.

Vertol 44 solves transport problem for oil industry

The petroleum industry has a new tool, the Vertol 44 helicopter, to cut manhours, money and misery out of exploratory drilling at remote sites.

The Vertol 44 is a heavy-duty, universal vehicle that makes the sky a 100 mph highway, almost any clearing a landing field. Gone is the need to hack roads in jungle, swamp and mountains. You may need it for these money-saving missions:

Flying Truck: The Vertol 44 carries more than 2 tons of cargo in tropical areas...transports the entire 175,000 lbs. of a drill rig over a distance of 50 miles out and back, in only 56 flying hours. Its 600 cu. ft. cabin accommodates 50% more cargo than any other commercial helicopter, with no problem of load placement.

Flying Bus: Airlifts up to 19 passengers ... 2 typical field crews ...to jungle derricks or offshore drills ... flies exploration teams to otherwise inaccessible spots.

Flying Crane: Hops rivers, ridges and swampland with sling-loads of pipe, rig superstructure, large pump components or even mobile field offices.

Flying Tractor: Frees mired vehicles, hauls barges, drags sledges. It has even towed a 3,000-ton ship.

For more information on this multi-purpose vehicle for the oil industry, write to: Customer Relations Department

VERTOL *Aircraft Corporation*

MORTON, PENNSYLVANIA.

DRILLING REPORT

5:30 P.M. Lost Circulation
6:15 P.M. Lost Rig

Cameron drilling control equipment has come a long way toward eliminating this kind of report. Safety conscious operators the world over are relying more and more on the security of blowout preventers, pressure operated gate valves and the many other dependable products produced by Cameron, world's largest manufacturer of oil field pressure controls. For safety and economy in drilling controls Count on Cameron.

Cameron
IRON WORKS, Inc.
P. O. Box 1212-Houston, Texas
Export Office: 7912 Empire State Bldg., New York City. In England: Cameron Iron Works Ltd., Time & Life Bldg., New Bond Street, London W. 1 England

What's New / IN EXPLORATION, DRILLING, PR

Canadian Senate Seeks Lands Act Amendment

A bill has been introduced in the Canadian Senate to give the government power to grant mineral and oil rights on submerged lands within its jurisdiction.

The proposed bill, which would amend the Territorial Lands Act, is designed to give the government power to administer lands under Hudson Bay and other northern waters, says an official of the Northern Affairs Dept. Several companies are interested in exploiting mineral and oil resources in the northern bays.

Though the government has always had jurisdiction over these submerged lands, no legislation exists under which it may grant title to oil claims on them.

•

Reda Pump Co. has asked the Texas Railroad Commission for revision of Texas Statewide Rule 12 (f), to permit installation of bottomhole centrifugal pumps without special hearing.

A Reda spokesman pointed out that the present rule provides that a hearing must be held and a permit issued by the commission before an operator may install a bottomhole centrifugal pump. He maintained that the rule discriminates against the Reda pump, because there are other pumps which do essentially the same job, but require no permit.

The company submitted a proposed form, which would allow operators to install Reda and other pumps if no objection is registered by offsets within a ten-day waiting period. If the commission sees no objection, the installation would be approved on recommendation of the commission's engineering department, without hearing.

•

Lone Star Gas Co. is planning to convert the Ambassador field, Clay County, Texas, to an underground gas storage project.

At a Texas Railroad Commission hearing, the company said that the wells would be converted to injection service.

The company is now storing gas in the New York City field, 6 mi. away. Lone Star proposed that rules to govern the storage project in the Ambassador field be substantially the same as those adopted for the New York City project.

•

Kewanee Oil Co. will extend its operations into Canada through formation of a Canadian subsidiary.

The subsidiary will be Canadian Kewanee, Ltd., with offices in Calgary.

Lance T. Crozier, chief landman in Tulsa for Kewanee, will be vice-president.

•

Arrangement for a gas outlet for the Lake End field, Red River Parish, La., has opened full production in the field, and is boosting drilling.

A contract for the sale of a minimum of 5-million cu. ft. of gas per day to Petrotex Chemical Corp. has been signed by Crowell, Nelson & Schmidt, of New Orleans.

Five new locations were staked in the field last week by Crowell, Nelson & Schmidt. They expect to have 40 tests drilled by the end of the year.

•

Superior Oil Co. of California will operate the recently approved Indian Creek Unit, comprising 4,523 acres in Butte County, Montana.

Superior has made location for a 6,500-ft. test of the Red River (Ordovician).

•

The Texas Mid-Continent Oil & Gas Assn. has named 13 Texas oil men to assist state authorities in the protection of underground fresh water supplies.

Robert E. Strief, of Dallas, was named chairman. A committeeman was named for each of the railroad commission districts.

Charles W. Alcorn, president of the association, says, "The industry has a grave obligation to do everything reasonably within its power to protect the fresh underground water of the state from pollution."

•

Three projects to increase oil recovery from Texas fields have been approved by the Texas Railroad Commission.

PRODUCTION

The commission approved a cooperative waterflood project for the Knox City, North (Canyon) field, Knox County, North Texas. Pan American Petroleum Corp. and others estimated recovery of an additional 60-million bbl.

Texoil Corp. hopes to boost recovery in the Lehn-Apco field, Pecos County, West Texas, by a unitized water injection program.

H. D. Egger and Texas Consolidated Oils expect a recovery of 500,000 bbl. additional from waterflooding two leases in the Langston-Kleiner field, Young County, North Texas.

•

El Paso Natural Gas Co. has sold its four rigs in the San Juan Basin, and has reorganized its drilling department. Two rigs were sold to San Juan Drilling Co., one to Great Western Drilling Co., and one to Claude Carroll Drilling Co.

El Paso says that the oil play in the area is sufficiently large and stable to make company-owned tools unnecessary.

•

The Navy plans to drill on the Teapot Dome Naval Petroleum reserve in Wyoming to prevent reservoir drainage from wells flanking the eastern border.

The Navy is drafting an operating agreement, and plans to invite bids within the next two months.

•

Home Oil Co. is planning to launch a waterflood project in the Turner Valley field of southwestern Alberta.

The company estimates that an additional 19-million bbl. of oil will be recovered from the field.

Three injection wells will be drilled in the north end of the field.

•

A new group, known as the Louisiana Offshore Oil Scouts Assn., held its first meeting last month in New Orleans.

The association was originated by Bailey Summers, of Gulf Oil Corp.'s land department.

•

The Wyoming Oil Gas Conservation Commission has taken under advisement an application of Continental Oil Co. for 80-acre spacing regulations in the Brooks Ranch field, in central Wyoming.

Five oil and gas companies have protested the application, contending that 40-acre spacing regulations should be imposed in the field, which is located just west of the Big Muddy field, Natrona and Converse Counties.

Continental's geologists testified at a hearing that one well could sufficiently drain an 80-acre tract.

•

If shareholders approve, Canadian Husky Oil, Ltd., will buy all assets of Liberal Petroleum, Ltd., Edmondton.

Canadian Husky will purchase Liberal's assets with shares of its common stock, which Liberal would distribute to its stockholders. Basis of distribution would be one share of Canadian Husky for each eight shares of Liberal.

Glenn E. Neilson, Canadian Husky president, says that the purchase of Liberal's assets brings to the company substantial light-oil reserves in Alberta, plus valuable acreage in northeast British Columbia and northwest Alberta.

•

The Texas Railroad Commission has approved an experimental miscible gas drive-waterflood project in the Slaughter field, Cochran County, West Texas.

Permission was granted to Atlantic Refining Co. to conduct the program on its 1,247-acre Boyd lease (PW—Nov.8'57,p22).

•

Drilling Highlights

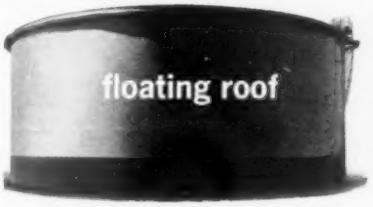
South Louisiana—Aluminum Co. of American No. 1 Mrs. Jane H. Schwing, section 43-8s-11e, on the Iberville-West Baton Rouge Parish line, flowed 521 b/d of 35-gravity oil through 12/64-in. choke and perforations at 11,224-ep ft. The discovery is 4 mi. northwest of Bayou Choctaw field.

In St. Mary Parish, W. T. Burton No. 1 State Lease 2,833 was completed for 61 b/d of 49-gravity distillate and 2,301,000 cu. ft. of gas daily through perforations at 14,744-65 ft. Operator lost the first hole, in which he had set the world's longest string of 9-in. pipe, at 17,772 ft.

Southwest Texas—Northern Pump Co. No. 1 Allen East et al, Kleberg County Frio sand discovery, was completed for open flow of 18-million cu. ft. of gas daily plus 1 bbl. of 55.8-gravity distillate to 34,000 cu. ft. of

HAMONDTANK

STORAGE TANKS



The **Hammond Tubeseal** for floating roof tanks, new or old, riveted or welded, is the most efficient and positive seal known. It is the only floating roof which does not have a vapor space between seal and product.

The only membrane type conservation tank with full-rated vapor and product capacity at all times, with a membrane that cannot come in contact with product, vapor space that can be isolated for inspection and maintenance without taking product storage tank out of service.

Hammond designs, fabricates and erects tanks of all types for liquid and dry storage... above and below ground...high or low pressure...cone roof, floating roof, globe roof, sphere, bullet, Dialift, Diaflote, Vaporlift, gas holder, etc. Experienced personnel and complete facilities are available for erection and rehabilitation of storage tanks in most parts of the world.

HAMMOND IRON WORKS

Sales Offices

744 BROAD STREET, NEWARK 2, N.J.

Offices and Plants

WARREN AND BRISTOL, PA.
PROVO, UTAH • CASPER, WYOMING
BIRMINGHAM, ALABAMA

gas. Production was through perforations at 8,217-22 ft.

Kansas—Shell Oil Co. No. 1 Light, section 17-35s-32w, Seward County wildcat between Southeast Liberal field and Light field, flowed 3.4-million cu. ft. of gas daily and 5 bbl. of condensate through perforations at 6,152-60 ft. and 6,192-210 ft. in the Chester. Through perforations at 6,066-88 ft. in the Morrow, the prospect flowed 1.6-million cu. ft. of gas daily. It will be dually completed.

Wyoming—Cabeen Exploration Co. No. 1 Husky-State, section 2-48n-103w, Park County, recovered 75 ft. of oil and 225 ft. of heavily mud-cut oil on 2-hour drillstem test of the Phosphoria at 5,094-139 ft. The wildcat is 4 mi. northeast of Fourbear field.

In Crook County, True Oil Co. No. 2 Koch, section 20-49n-68w, was completed as a Dakota discovery for 50 bbl. of oil per hour with 24/64-in. choke and perforations at 6,504-20 ft.

Montana—Murphy Corp. No. 101 Unit, section 14-28n-51e, Roosevelt County, recovered 2,310 ft. of oil on 2-hour drillstem test of Heath sands at 4,958-68 ft. The prospect is in the south end of East Poplar field, where production is from the Madison, except for one well, which produces from the Kibbey.

Mississippi—Gulf Oil Corp. No. 1 Charles Green, section 2-9n-9w, Wayne County, deep pay opener for the Eucutta field, was completed for 184 b/d of 40-gravity oil through perforations at 8,067-69 ft. It is believed the producing zone is either the Washita-Fredericksburg or the Paluxy. This is the first production below 5,000 ft. in the field.

North Texas—A. R. Dillard et al, No. 1-54 Upshur County School Land, block 54, Upshur County School Land Survey Mississippian discovery in Baylor County, flowed 979 b/d of 39.5-gravity oil through 24/64-in. choke and open hole at 5,220-34 ft. The discovery is 10 mi. southwest of the Rendham Mississippian pool.

In Archer County, LaGorce Oil Co. No. 1-A Marguerite Andrews, block 75, Jefferson County School Land survey, flowed 238 b/d of 41-gravity oil through 16/64-in. choke from 5,153-81 ft. in the Mississippian. The well is 2 mi. southeast of nearest Mississippian production.

In Clay County, Sewal Investment Co. No. 1-A J. W. Harvey, block 27, Madison County School Land Survey, A-302, was completed as a Caddo conglomerate discovery for 751 b/d of 43-gravity oil through 24/64-in. choke and open hole at 5,840-46 ft. The discovery is 3 mi. northeast of Ringgold.

Oklahoma—White Star Oil Co. No. 1 Matthews, section 21-26n-9e, Osage County, was completed for 165 b/d through 18/64-in. choke and perforations at 2,201-07 ft. in the Burgess (Pennsylvanian).

Northeast Louisiana—Marline Exploration, Inc., No. 1 Magee-Evans, section 43-6n-9e, Concordia Parish, was completed as a Sparta discovery for 60 b/d of 24.8-gravity oil through 9/64-in. choke and perforations at 3,224-25 ft. The discovery is 2 mi. northwest of Experance Point field.

Texas Gulf Coast—Michel T. Halbouty No. 1-A Foster Lumber Co., M. B. Lawrence Survey, A-310, Montgomery County, was completed as a gas-distillate discovery in the Wilcox sand. The well tested 1.5-million cu. ft. of gas daily plus an ungauged amount of distillate through ¼-in. choke and perforations at 10,879-89 ft. Nearest Wilcox production is in McCoy field, 8 mi. west.

Dependable

HERCULES STUFFING BOXES end Your pumping worries*

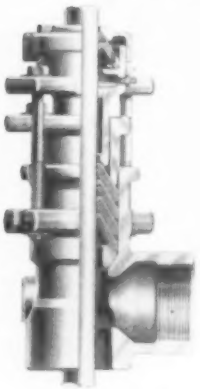
HERCULES Duplex Polished Rod Stuffing Boxes are constructed from high grade malleable iron (55,000 PSI Tensile Strength) and are rated 3,000 pound test. Flexibility and the cone-shaped Packing Rings are the combination of factors which make the HERCULES Stuffing Box without equal for any pumping situation.

HERCULES OIL RESERVOIR UPPER GLAND

**Any HERCULES Stuffing Boxes may be equipped with Oil Reservoir Upper Glands on "problem" wells which pump-off and burn packing. The polished rod moves through the oil in the reservoir which lubricates and cools it.*

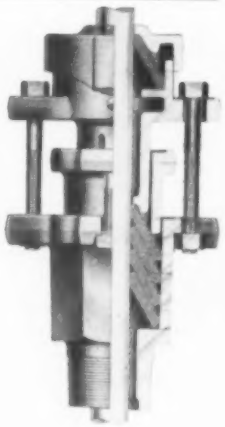
"TEE TYPE" DUPLEX POLISHED ROD STUFFING BOX

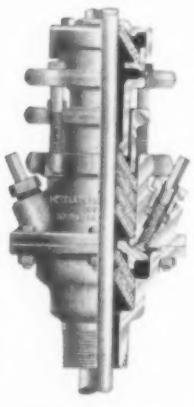
HERCULES "TEE TYPE" Stuffing Box is very compact, only 15" high. It is full opening which allows rods to be run or pulled without removing Stuffing Box body. It is furnished in 2", 2½" and 3" sizes with any API Tubing or Line Pipe Thread.



"REGULAR TYPE" DUPLEX POLISHED ROD STUFFING BOX

The old reliable, tried and proved on thousands of wells from coast to coast and in many foreign fields.





"TYPE DP" DUPLEX POLISHED ROD STUFFING BOX

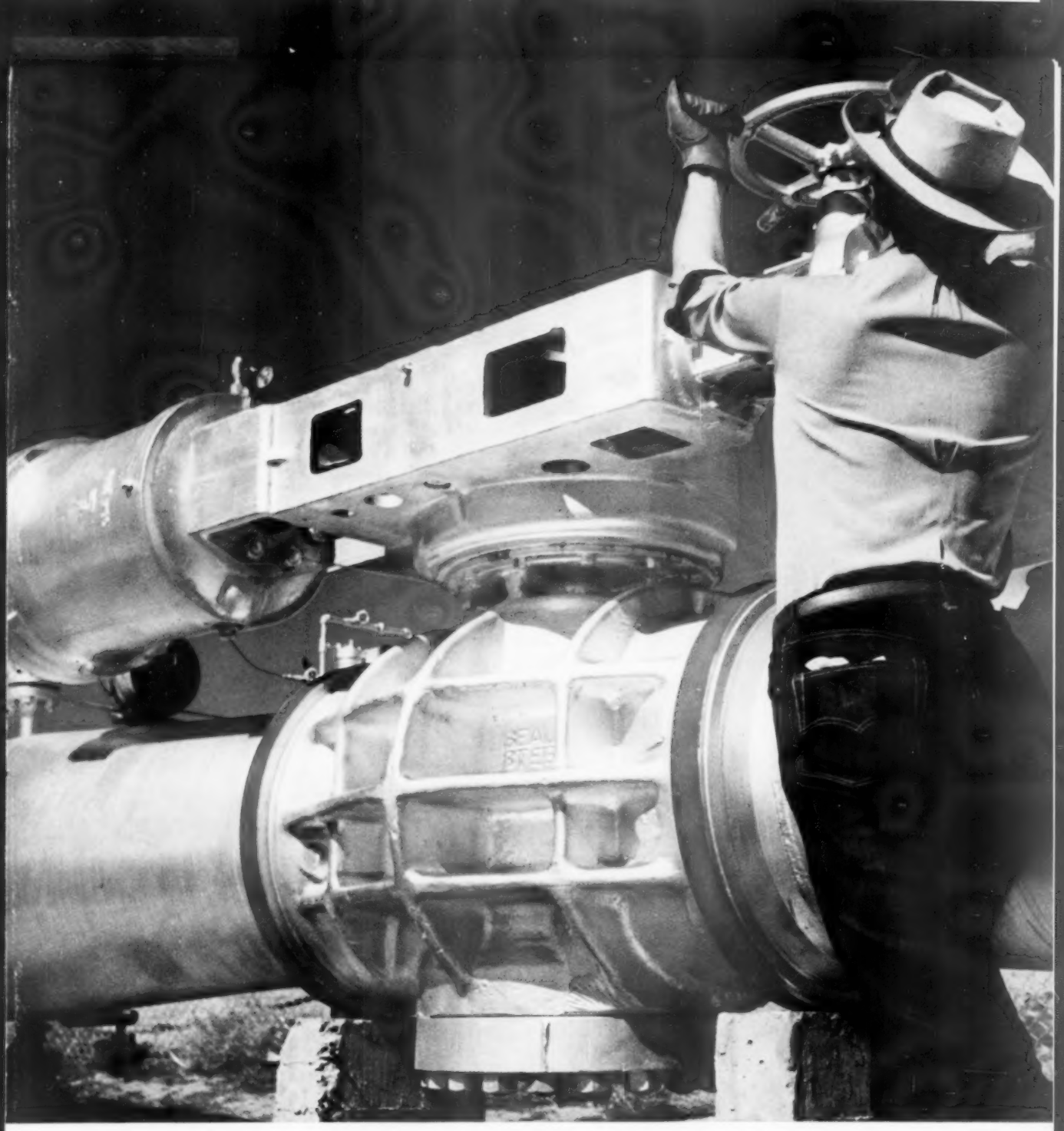
A double packed Stuffing Box for use on high pressure wells and those that flow intermittently. Especially desirable for wells located near buildings, fire hazards or growing crops. Two compression bolts, in bottom sections, are tightened on lower packing set while replacing packing in upper section. Possess same flexibility as the regular and Tee base type.

HERCULES TOOL Company

"MANUFACTURERS OF OIL FIELD EQUIPMENT SINCE 1924"

GENERAL OFFICES AND PLANT TULSA, OKLAHOMA

Export Representative: Oil Field Equipment Co., Inc., 30 Church Street, New York 7, N. Y.



EMERGENCY! Are you sure your key valves will operate when an emergency comes? They will, *if* they are Rockwell-Nordstrom valves with *pressurized lubrication* that makes operation fast, easy and *sure*.

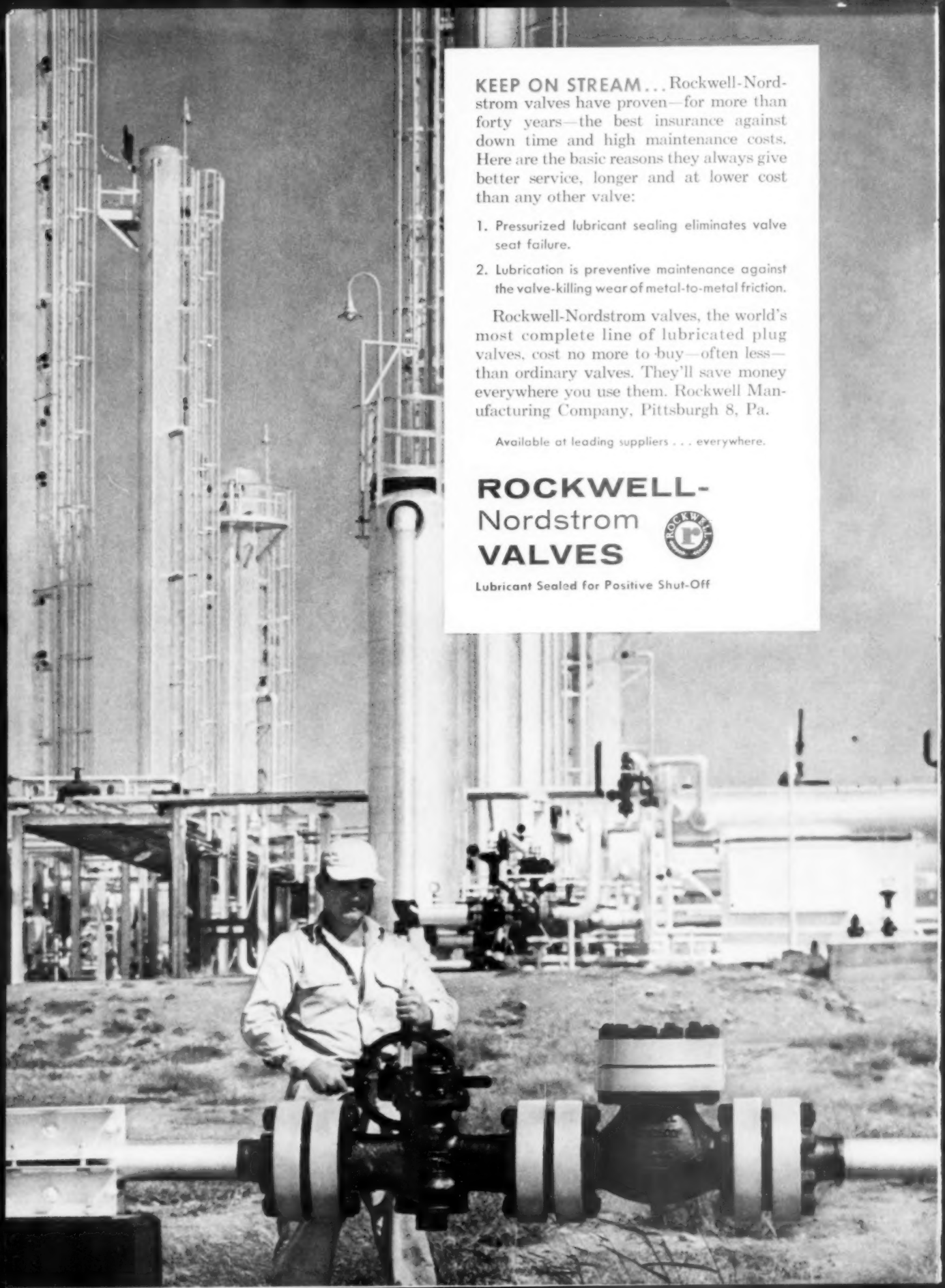
Unlike the forced seating in ordinary valves, the Rockwell-Nordstrom valve plug is kept friction-free by lubricant—frozen or stuck valves are eliminated. And quarter-turn closure is two to five times faster.

The lubricant in Rockwell-Nordstrom valves does another important job: it eliminates metal-to-metal wearing friction for longer valve life. Yet with all their obvious advantages, Rockwell-Nordstrom valves cost no more to buy, often less, than ordinary valves. Rockwell Manufacturing Company, Pittsburgh 8, Pa.

Available at leading suppliers . . . everywhere.

ROCKWELL-
Nordstrom
VALVES

Lubricant Sealed For Positive Shut-Off



KEEP ON STREAM... Rockwell-Nordstrom valves have proven—for more than forty years—the best insurance against down time and high maintenance costs. Here are the basic reasons they always give better service, longer and at lower cost than any other valve:

1. Pressurized lubricant sealing eliminates valve seat failure.
2. Lubrication is preventive maintenance against the valve-killing wear of metal-to-metal friction.

Rockwell-Nordstrom valves, the world's most complete line of lubricated plug valves, cost no more to buy—often less—than ordinary valves. They'll save money everywhere you use them. Rockwell Manufacturing Company, Pittsburgh 8, Pa.

Available at leading suppliers . . . everywhere.

ROCKWELL-
Nordstrom
VALVES

Lubricant Sealed for Positive Shut-Off

To Consent or Not to Consent?

Not since the days of the Manhattan (atomic) Project has any subject been shrouded in as much secrecy as the current negotiations on a possible consent degree in the so-called international oil "cartel" case.

From the few indications that have come out, however, the terms on which the Justice Dept. apparently is willing to drop its 4½-year-old case would have considerable significance for wide segments of the petroleum industry.

This would be true not merely for the handful of big international companies directly affected. It would also be so for scores of other small, medium, and large American companies now going overseas for the first time.

* * * *

According to affidavits filed in U.S. District Court in New York seeking postponement of proceedings until Dec. 17 (which was granted), the settlement proposed by the Justice Dept. reveals it is ready "not to question, from an antitrust point of view, the joint activities of American oil companies related to foreign production, refining, or transportation of crude oil and refined products."

In other words, the Justice Dept. apparently is willing to settle for disbanding of joint marketing activities overseas in return for legal clearance of joint production, refining, and transportation operations.

Thus far, these negotiations have involved only Jersey Standard and Gulf (which would have the least to lose in disbanding joint marketing).

The other three defendents—Texaco, Socal, and Socony—so far have not been willing to discuss settlement along these lines. In the case of Socal and Texaco, this may at least be partially due to the fact that, as joint owners of the big Caltex marketing organization, they would be hardest hit by such dismemberment.

Thus, it would not be entirely surprising if the latter two continue to prefer taking their chances in court (unless it becomes apparent that a consent decree by the other companies would freeze the handwriting on the wall). At any rate, the Justice Dept., whether for strategical reasons or not, recently indicated it may not be willing to agree to a consent decree unless all five defendants sign it.

It is too early for prediction. The parties are still playing their cards close to their vests.

* * * *

The significance of such a consent decree, however, would lie not so much in what it specifically prohibited—but in what it permitted.

For it would be, in effect, the first clear-cut Justice Dept. approval of the existing—and growing—industry practice of reducing foreign risks by combining in joint producing, refining, and transportation operations overseas.

This trend is not confined to the international companies. It is particularly marked with the scores of smaller and medium-sized American companies going overseas for the first time—which could neither put up the vast capital nor take the foreign risks on an individual basis (witness Venezuela and North Africa).

Such a consent settlement would mark quite a turnabout from the Justice Dept.'s official position in the present "cartel" case pending in court. In this suit, launched during the political heat of the 1952 election campaign, the Justice Dept. still attacks every phase of the big companies' foreign operations, including joint producing.

(In 1954, true, Justice approved the Iranian consonsortium agreement involving joint production, refining, and transportation. But this was confined to one specific case, and done only on the insistence of the National Security Council.)

* * * *

Joint marketing overseas is a horse of another color. The industry trend is not in this direction.

The only joint marketing venture still held by either Jersey or Socony is their combined Far Eastern operation through Standard-Vacuum Oil Co.

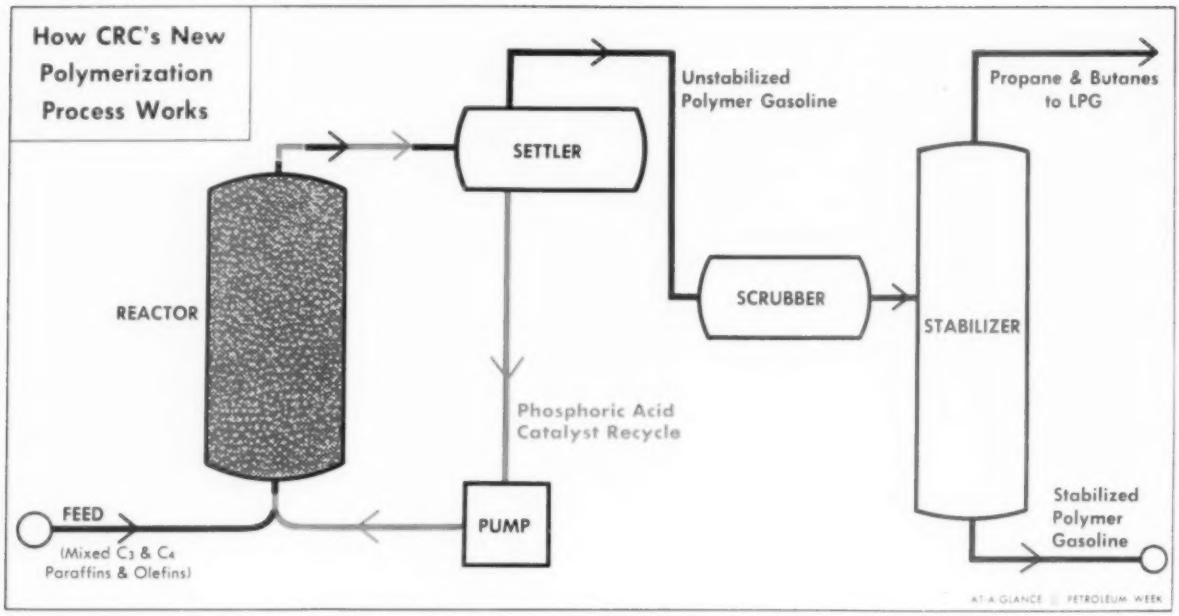
Since the war, both companies have been building up their own individual direct marketing networks around the world. It is no secret that Jersey would not be broken-hearted if the joint Stanvac market was now disbanded in the Far East. It could then complete its round-the-world string of direct markets under its own brand.

Gulf has no jointly owned markets abroad. (The only exception might be in interpretation of its minority stock interest in UPSC. UPSC, together with Jersey Standard, is interested in a French marketing company).

The major exception among American companies is the Caltex marketing unit in Europe and the Far East.

A break-up of Caltex's marketing would have considerably greater impact on its owners than a break-up of Stanvac's markets. In contrast to Jersey and Socony, neither Texaco nor Socal are large established marketers on their own in the Eastern Hemisphere.

Thus, it's not likely that they'd be agreeable to dismemberment of the Caltex marketing organization —on which they've spent so much effort in recent years—without a fight.



LIQUID PHOSPHORIC ACID CATALYST is used to make high-octane motor gasoline out of light olefins as . . .

Cat Poly Gasoline Goes Continuous

The industry's first continuous process to make cat poly gasoline has been developed by California Research Corp. The new process uses a continuously circulating liquid catalyst instead of conventional fixed-bed catalysts.

CRC's new process has been dubbed "The California Bulk Acid Polymerization Process." As in previous cat poly processes, phosphoric acid catalyst is used to polymerize light olefines (such as propylene and butylenes) to make a very-high-octane blending stock for motor gasolines.

The unique feature of CRC's development is that bulky and difficult-to-handle fixed catalyst beds have been replaced by a circulating liquid catalyst.

The older processes differ from the new process in that they impregnate, or coat, granular material (such as special quartz or kieselguhr) with phosphoric acid to make the catalyst bed.

The liquid catalyst process results in smaller equipment, better process control, improved product yelds, and fewer catalyst-handling facilities.

Good temperature control is an outstanding operating advantage for the liquid catalyst process. This results from the thorough mixing of the hydrocarbon feedstock and the catalyst. Such mixing is not possible in fixed catalyst beds, where the feed will often channel through the granular material, causing local overheating and poor process control.

No recycle stream from the poly gasoline recovery section is used in the liquid catalyst process, because conventional propane or butane quench is not needed for temperature control.

Catalyst can be replaced, or added to the reaction system, through the acid recirculation system, without interrupting plant operation. This gives a high operating factor for the process.

Special site facilities, needed when loading and unloading solid support catalyst, are virtually eliminated in the liquid catalyst process.

CRC's liquid catalyst process has been verified in both pilot-plant and larger-scale demonstration-plant operations.

Following process development on a small scale, a demonstration plant with 75 to 100 b/d feed capacity was erected in a refinery.

The demonstration plant was operated continuously for over 3,000 hours from refinery gas feed streams. Conversions of 95%-98% were obtained with both propylene and mixed propylene-butylene feeds.

Catalyst age was carried to 45 gal. of polymer produced per pound of acid. Partial replacement of the acid was carried out without interrupting plant operation. Corrosion rates of construction materials in the process units were low.

In operation, the process contacts the olefin feedstock with the liquid catalyst. Polymer gasoline product is then stabilized and made ready for blending into motor gasoline.

A small, high-efficiency reactor brings the liquid phosphoric acid into intimate contact with the olefin feedstock.

The phosphoric acid used as catalyst is commercially available from several suppliers in the U.S. and abroad.

Feed to the plant may be either a gas or a liquid stream of propylene, butylenes, or a mixture of both. The feed is caustic-washed to remove hydrogen sulfide and mercaptans, then water-washed to remove nitrogen compounds.

Hydrocarbon polymer and acid from the reactor are separated in a conventional settler vessel. In normal operation, all of the acid is removed from the polymer in the settler. However, caustic-scrubbing of the polymer from the settler is provided as a protection for the recovery system from corrosion caused by traces of acid carryover.

The acid stream from the settler is

CANADA drills 10 new wells a day!

An estimated 3,970 new wells will be drilled in Canada this year—an average of more than ten each day. This is a record high number and nearly three times as many wells as were drilled in Canada in 1950.

Leading the free world outside of the U.S. in oil exploration and development activity in 1957, Canada offers some of the most exciting petroleum opportunities on earth to enterprising U. S. oilmen.

U. S. Oilmen Call In Canada's First Bank

Through more than 250 branches covering Canada's western oil-rich provinces, the B of M is providing day-by-day, on-the-scene service to numbers of American oilmen participating in the development of Canadian oil. This oil-sensitive Bank has the organization and resources to give unique assistance at every phase of your oil operation north of the border.

Ask the B of M about...

Canadian Company Formation
Exploration Regulations
Reservations of Oil and Gas Rights
Lease Terms and Royalties
Taxation and Exchange
Financing

FOR A PROMPT REPLY, contact C. A. P. Leahey, Special Representative, Bank of Montreal, Calgary Main Office, 140 Eighth Avenue West, Calgary, Alberta, Canada, (Telephone AMherst 6-8701) or address our nearest U.S. office or Head Office, Montreal.

NO STOCK RECOMMENDATIONS

While the Bank is prepared to provide all available information on the oil industry, it does **not** *make recommendations regarding the purchase of individual oil stocks.*

"MY BANK" TO 2 MILLION CANADIANS

B of M

BANK OF MONTREAL

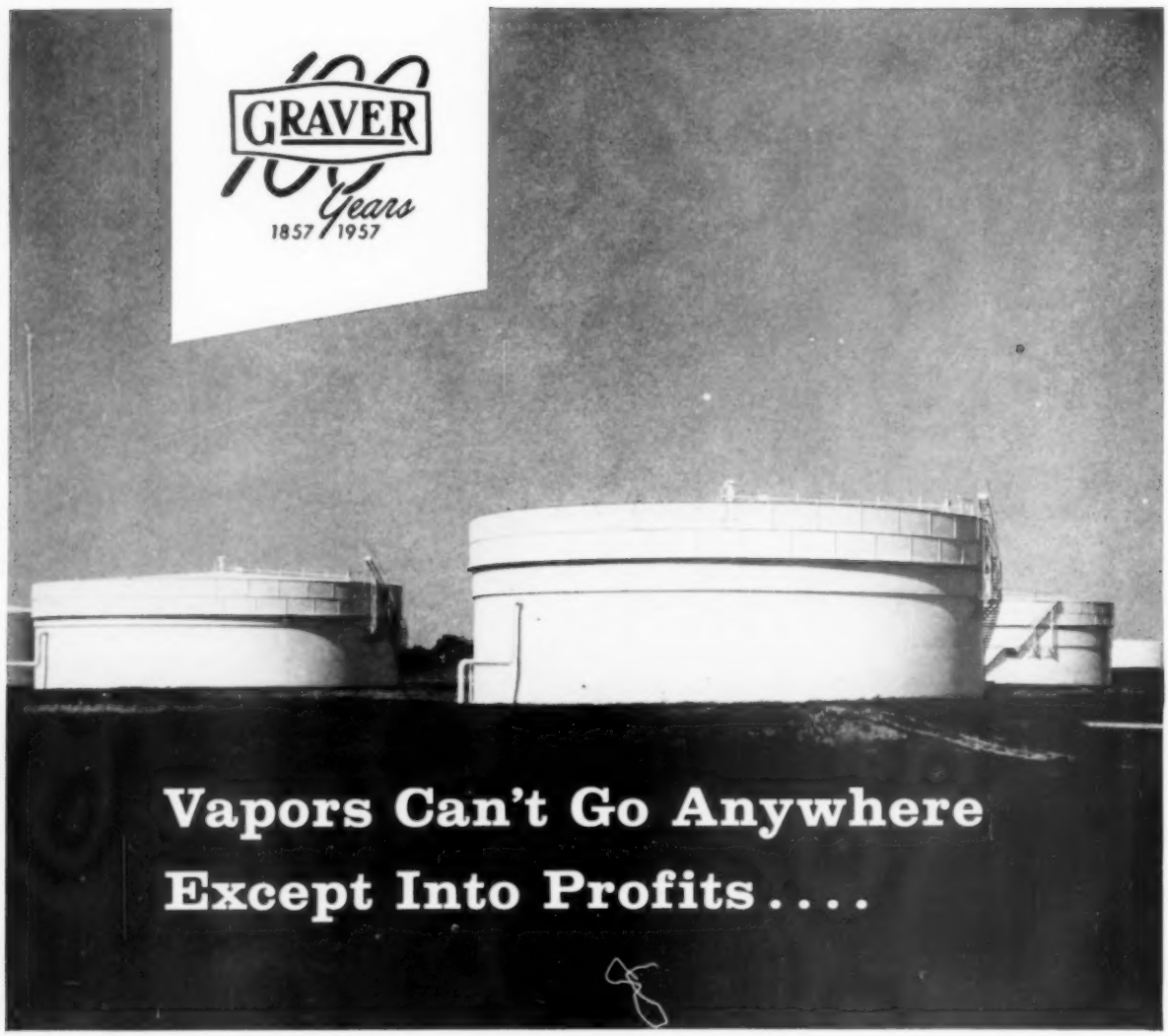
Canada's First Bank Coast-to-Coast

In Canada since 1817 • In the U. S. since 1859

NEW YORK . . . 64 Wall Street • SAN FRANCISCO . . . 333 California Street
CHICAGO: Special Representative's Office, 141 West Jackson Blvd.

Head Office: Montreal

700 BRANCHES ACROSS CANADA • RESOURCES EXCEED $2,700,000,000



WITH THE ROOF THAT BREATHES!

Your vapor-loss control projects find ready solution when turned over to Graver—champions of vapor conservation since the turn of the century.

For example, the efficiency of the vapor-control method provided by the patented Graver Expansion Roof® Tank has long been recognized as the most effective method for minimizing gasoline vapor losses.

This trouble-free roof virtually breathes vapors back into profits. As vapors form, the roof ascends. As they condense, the roof descends. Reabsorption of vapor is speeded by the weight of the roof. No other lifter roof matches the operating smoothness of the Graver Expansion Roof.

The volume of vapor space afforded by the 10 foot lift is ample to protect not only the contents of the Expansion Roof Tank itself, but also the product stored in adjacent manifolded cone-roof tanks as well.

If your problem is that of providing against vapor loss during the storage of product—or volatile crudes or chemicals—in single or multiple-tank installations, the Graver Expansion Roof Tank is the key to profitable operations.

GRAVER®

Building for the Future on a Century of Craftsmanship in Steels and Alloys

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

New York • Philadelphia • Edge Moor, Delaware • Pittsburgh
Detroit • Chicago • Tulsa • Sand Springs, Oklahoma • Houston
New Orleans • Los Angeles • Fontana, California • San Francisco

cooled and returned to the reactor. This acid provides a high-heat-capacity "flywheel," so that the temperature rise in the reactor is relatively small. This aids in controlling reaction temperature to within narrow limits.

Polymer product leaves the caustic scrubber and goes to the recovery section for stabilization to yield a polymer gasoline of the desired vapor pressure.

Average conversion of the olefin feed in the process is 95%, giving a high-octane blending stock to improve the road octane rating of motor gasoline. Added to today's typical premium and regular gasolines, poly gasoline either maintains or improves the road octane rating.

For example, 20% polymer added to a light olefin-aromatic base gasoline (101.5 F-1-octane) maintains the road octane.

When added to a 98 F-1-octane paraffin-aromatic base gasoline, 20% poly gasoline raises the road rating by 0.5 octane.

The accompanying table illustrates a few of the more important properties of a typical debutanized motor poly gasoline made from mixed propylene-butylene feed:

Gravity, API	59.5
ASTM D-86:	
IBP	132F
10%	206F
50%	271F
90%	372F
EP	439F
Octane Number:	
F-1 Clear	96.8
F-1 + 3 ml. TEL	101
F-2 Clear	82.5
F-2 + 3 ml. TEL	86.0

The idea of a bulk liquid catalyst has attracted processors for some years. However, until materials of construction able to withstand the corrosive action of hot phosphoric acid were developed, the liquid process was not practical.

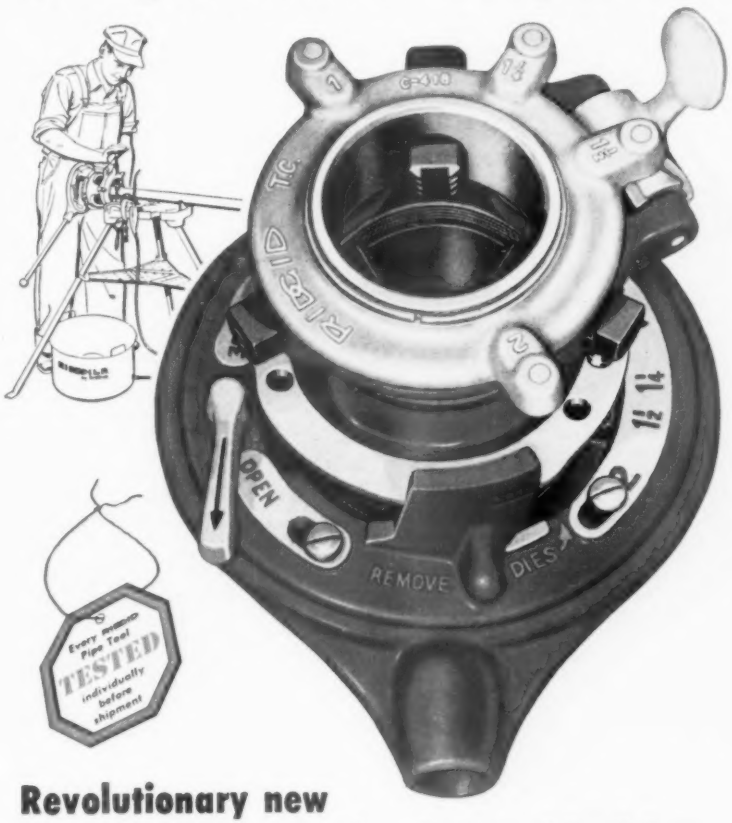
California Research Corp. was forced to undertake a materials development program to make the liquid-catalyst process work. There was no commercial equipment available at competitive costs for withstanding the corrosive action of phosphoric acid at the required temperature and concentration.

A suitable alloy was found, and commercial fabrication procedures were developed successfully. The resulting equipment shows very low corrosion rates when used in the liquid catalyst.

The process is available under license from California Research Corp., 200 Bush Street, San Francisco, Calif.

RIDGID Jamproof 65R

Now Guarantees
Straight Threads Every Time



Revolutionary new
TC (True-Centering) Workholder
centers all pipe, even over or under size

No more crooked threads! 65R pre-sets to size by turn of TC workholder gauge ring—tightens by palm-of-hand push on forged cam lever. All 3 jaws close together on pipe by one mechanical action.

Straight threads, drip threads if desired, jamproof, 1" to 2" with 1 set of dies, fast size change—only 65R offers you so much for your money. Buy it at your Supply House.

P. S. The new TC workholder fits your present 65R!

The Ridge Tool Company, Elyria, Ohio, U. S. A.

RIDGID
Work-Saver Pipe Tools

FIELD APPLICATION PROVES FLUDEX EFFECTIVENESS

TRETOLITE COMPANY
FLUDEX
SAINT LOUIS • LOS ANGELES

PROBLEM: An injection well in Oklahoma was taking just 51 barrels per day with valve wide open. A pressure recorder showed pressures of 810 pounds at well and 950 pounds at plant. FLUDEX treatment was decided upon in an effort to increase injection rates and reduce the pressures. The procedure that was followed is described below: the results are shown on the graph.

PROCEDURE:

1 New water meter was installed.

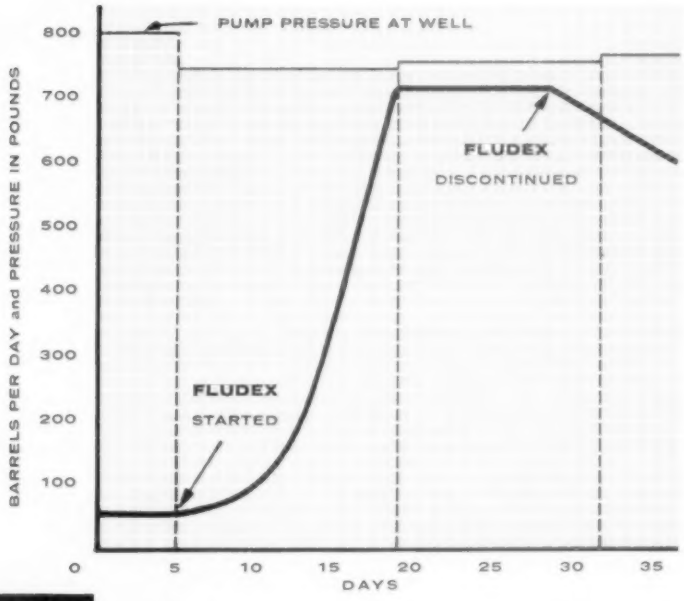
2 All valves were checked to be sure they were fully open.

3 Fludex injection was started at the rate of two quarts per day, using a gas powered chemical pump.*

4 Input volumes, pressures and chemical usage were carefully checked and recorded.

**Injection pump malfunction resulted in an average chemical injection of only 1⅓ quarts per day, due to low gas pressure at certain periods.*

well injectivity increased from 51 to 720 B/D in 14 day period



SUMMARY: **BEFORE** treating with Fludex, maximum injection possible was 51 barrels per day at a well pressure of 810 pounds.

AFTER treating with Fludex for 14 days, with an average chemical usage of 1⅓ quarts per day, the well "potentialed" at an injection rate of 720 barrels per day, with an injection pressure of only 760 pounds, *fifty pounds less pressure for over 14 times as much fluid injected!*

Get complete information today. Ask the man in the Tretolite car or write for the new Fludex booklet.

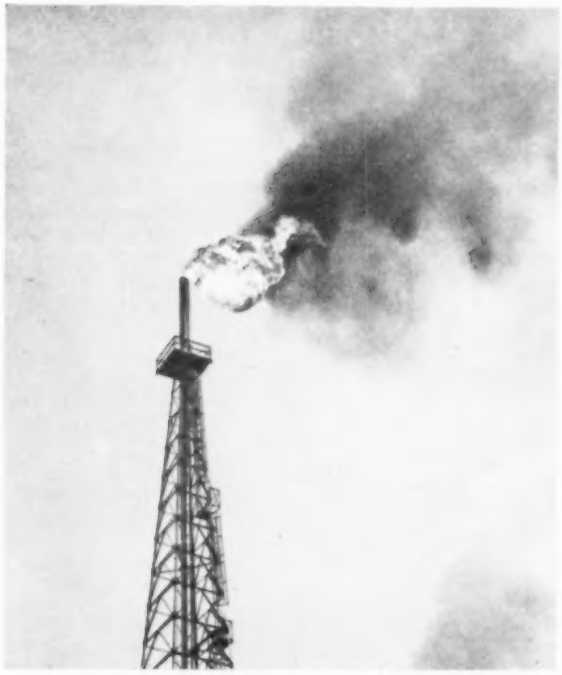
FLUDEX ENABLES WELLS TO TAKE MORE WATER, AT LOWER PRESSURES, IN LESS TIME

TRETOLITE COMPANY
A DIVISION OF PETROLITE CORPORATION

TWF-57-4

369 Marshall Avenue, St. Louis 19, Missouri • 5515 Telegraph Road, Los Angeles 22, California

Chemicals and Services for the Petroleum Industry • DESALTING • DEMULSIFICATION • CORROSION INHIBITING • SCALE PREVENTION • FUEL OIL ADDITIVES • WATER DE-OILING • METAL DEACTIVATION



A BAD DAY for gas flaring in 1951, compared to . . .

REDUCED FLARE SMOKE in 1957, as Esso proves that . . .

Planned 'No-Flaring' Cuts Smoke

An 85% reduction in refinery flaring since 1951 is the dramatic result of a high-priority flare smoke reduction program at Esso Standard Oil Co.'s Bayway (N.J.) refinery.

The refinery is well along toward its goal of making flares "almost unneeded" (chart, below), except in cases of emergency flaring during process unit upsets.

The flare-reduction efforts are part of a three-part antipollution program in effect at Bayway. Results to date have been a 65% net over-all reduction in air pollutants by the refinery from 1952 to 1956.

Included are an 80% reduction in smoke (mostly from flaring), a 50% reduction in evaporation to the atmosphere, and a 40% reduction in catalyst dusts entering the air.

Esso's current goal for the 168,000 b/d refinery is a maximum of 50 b/d lost in flaring. This compares to an average rate of 370 b/d in 1951, 82 b/d in 1956, and 70 b/d so far in 1957.

Esso's timing at Bayway predated recent "tough" air pollution regulations now being put into effect by the New Jersey legislature.

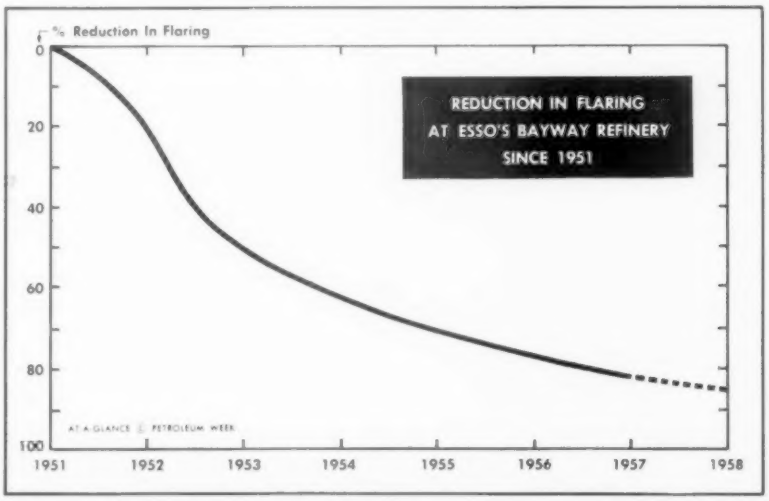
New Jersey is changing from a state notorious for no air pollution regulations into a state with very severe air pollution laws.

Already there are statutes on the books to control smoke emission from boilers, furnaces, burning dumps, and similar installations. The latest statute, Chapter IV of the series, is the one applying to smoke from flare stacks. It was issued Sept. 16, 1957, and will go into effect Jan. 1, 1958.

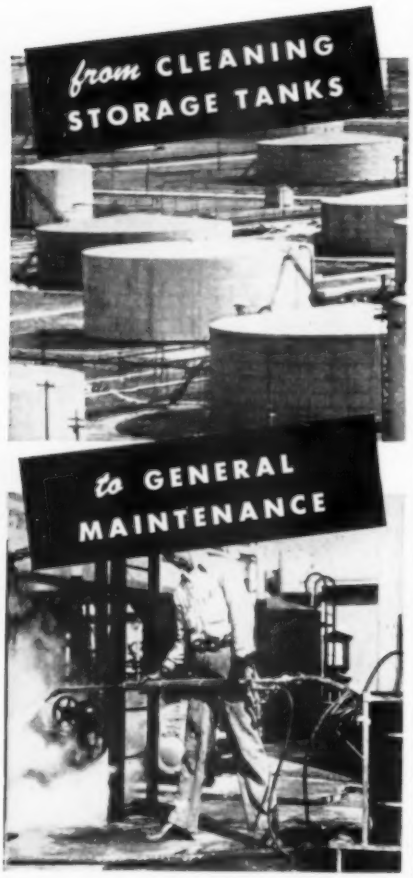
In part, the smoke regulation states: "No person shall cause, suffer, or permit smoke from any fuel-burning equipment, the shade or appearance of which is darker than No. 2 of the Ringelmann Smoke, to be emitted in the open air."

Esso has already been affected by Chapter I of the air pollution regulations which control smoke from incinerators. Before, Esso had used the non-smoke producing land-fill method of disposing of burnable material. However, land-fill space is limited, so now Esso is building an incinerator.

Esso officials believe that industry should be, and is, in favor of reason-



AN 85% REDUCTION IN FLARING within six years is the result of an active anti-smoke campaign in effect since 1951 at Esso Standard Oil Co.'s Bayway (N. J.) refinery.



Oakite cleaning does it better, reduces costs

Going inside an 80,000 gallon storage tank to clean manually was slow, wasteful; but with Oakite detergents and spray method, the entire inside was bared clean in only 12 hours, costs cut over 75%.

How to get at hard-to-reach surfaces and remove grease and muck without scraping or wire brushing? With an Oakite Steam-Detergent Gun. At one refinery, it helped a man do two weeks work in a day.

Just two more of the many ways the Oakite man and the materials, methods and equipment behind him can *simplify* and *save* on your cleaning operations. Send for Bulletin F-7629. Oakite Products, Inc., 39 Rector Street, New York 6, N. Y.

OAKITE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

able air pollution legislation. Also, industry must cooperate with law-enforcement agencies from the very beginning of a smoke abatement program.

The basis of Esso's program is a "watch-dog" group charged with measuring and reducing refinery flaring. A refinery staff group, called the Conservation Control Division, is responsible for the reduction of product loss and prevention of air pollution caused by flaring.

This group is on duty around the clock, seven days a week. They not only try to find the sources of gases feeding into the complex refinery flare system, but they study and recommend ways to reduce flaring.

The primary target of the program is to reduce emergency flaring. This is done by better instrumentation and training to cut equipment and manpower failure, by sending gases to a gas-recovery unit, and by tailoring unit operations to fit the emergency conditions.

Faulty operation of equipment can often be prevented by improved instrumentation on troublesome units. Training of operators helps them reduce the number of unit upsets. When emergencies do arise, training helps them know how to regain control of the unit quickly, and thus keep flaring to a minimum.

An example of using gas-recovery facilities and tailoring unit operations is found in Esso's 100,000 b/d Model III fluid catalytic cracking unit. If one of the three gas compressors were to fail, an excessive amount of gas from the unit would go to the flare system.

If the cracker feed rate is not reduced, the remaining two compressors cannot handle the flow of gas. Some of the excess gas can be compressed by the gas recovery system compressor. Or the feed rate can be reduced, so that there is no excess gas from the cracker.

Esso prefers to cut feed rate rather than cause excess flaring. Of course, there is a short period, while feed rates are being adjusted, during which the gas compression and flare systems must handle the gas overload.

In general, Esso feels that recovery of excess hydrocarbons in a gas recovery system is at best, marginal at Bayway, especially if added compression is needed. It is considered better to spend the money on improved instrumentation, giving better unit operation, and reducing the hydrocarbons sent to the low-pressure flare system.

There are some spare compression facilities for low pressure gases at Bayway. These were installed specifically to feed the high-pressure gas recovery plant. The compressor was left as a spare because of a change in other operations.

The second goal of the program is strict enforcement of "planned no-flaring" during scheduled startups and shutdowns. Preplanning helps operators control emission of potential flare gases.

At the Bayway refinery, there is no planned flaring. The only flare gases come from unit leaks into the flare line laterals, and from unplanned process-unit upsets.

By planning ahead of time, it is possible to send volatile liquids to pressure spheroids.

These liquids are never pumped to standard cone roof tanks where the vapors can flash to the atmosphere.

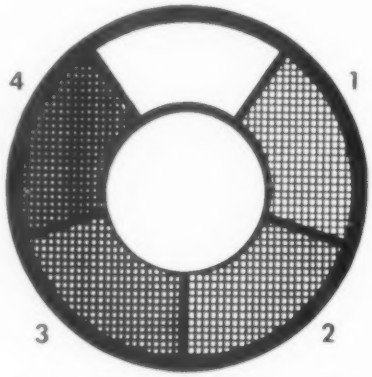
Gases from the startup or shutdown procedure are sent to the gas compression and recovery systems.

The third part of the antipollution program is diligence in stopping leaks in equipment connected to the flare system. This includes "no-exception" shutdowns of equipment known to be leaking.

At any time an item of equipment is found to leak excessively into the flare system, it must be taken off stream and repaired immediately.

Since dozens of flare-line laterals may feed into a common flare stack, leaks are sometimes hard to locate. Unless the leak is visible or audible, a planned shutdown on a trial-and-error basis may be needed to locate the "leakers."

Esso has used the last-resort tech-



MODIFIED RINGELMANN SMOKE CHART has four "gray" readings plus black and white. Hold the chart at arms length and sight at the smoke through hole in center. The chart color closest to (but at least equal to or darker than) the smoke color gives the Ringelmann Smoke number. These charts are made by Ess Instrument Co., Bergenfield, N. J.

World's Finest Oil Field Power

WAUKESHA

ENGINES and POWER UNITS

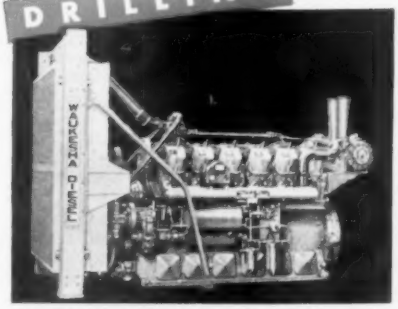
10 hp to 1235 hp

WAUKESHA
MOTOR COMPANY
WAUKESHA, WISCONSIN
New York • Tulsa
Los Angeles

Send for
BULLETIN 1079

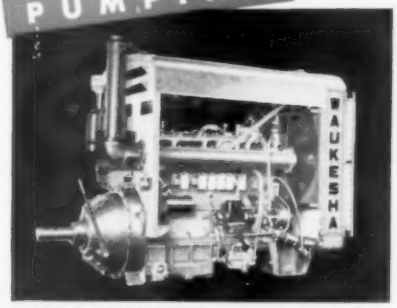
362

DRILLING



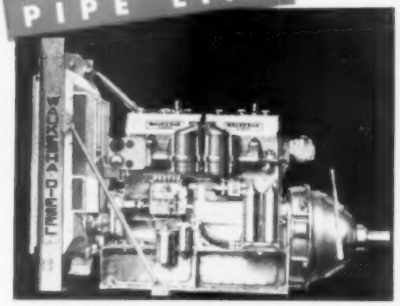
VLRDBSU Turbocharged Diesel Unit—twelve cyl., 8½-in. bore x 8½-in. stroke, 5788 cu. in. displacement, 1190 hp at 1200 rpm.

PUMPING



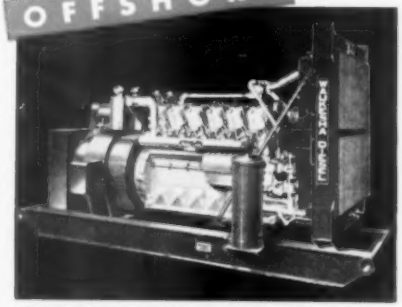
WAKU Special Long Life Unit—six cyl., 6¼-in. bore x 6½-in. stroke, 1197 cu. in., 125 continuous (65%) hp at 1200 rpm.

PIPE LINE



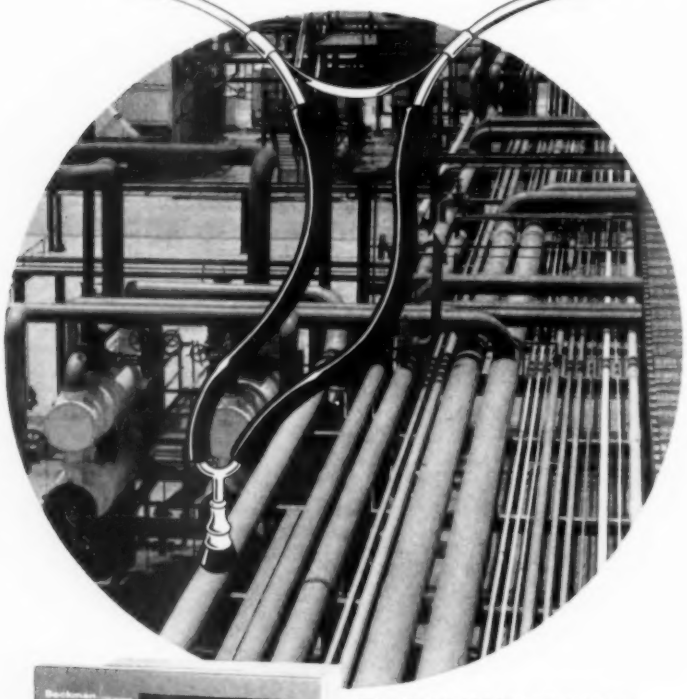
NKDBU Normal Diesel Power Unit—six cyl., 7-in. bore x 8¼-in. stroke, 1905 cu. in., 270 hp at 1200 rpm, (to 360 hp turbocharged).

OFFSHORE



VLRD Series Diesel Enginator—twelve cyl., 8½-in. x 8½-in., 5788 cu. in. engine direct connected to heavy duty AC Alternator—up to 800 KW.

DIAGNOSE PROCESS UPSETS with Gas Chromatography



The Model 120 Industrial Gas Chromatograph automatically analyzes up to four components in single or multiple streams... continuously. This unit – as well as the Model 220, capable of analyzing up to eight components – is available in air-purgeable or explosion-proof housings.

Continuous gas chromatography is the quickest way to get an accurate picture of your process composition... an assurance of optimum production. This technique allows you to maintain correct material balance, and instantly warns you of production upsets. Eliminate the costly dangers of delayed analysis reports – use continuous 'round-the-clock chromatography for rapid, accurate stream analysis.

Visit Booth 333, Chemical Show, N.Y.C., Dec. 2-9.
For more information about Beckman Industrial Gas Chromatography, write for Bulletin 2-P-11-79

Beckman®

Process Instruments Division
2500 Fullerton Road, Fullerton, California
a division of Beckman Instruments, Inc.

GAS CHROMATOGRAPHS • INFRARED GAS ANALYZERS • INDUSTRIAL pH SYSTEMS • THERMAL CONDUCTIVITY ANALYZERS
ELECTROLYTIC HYGROMETERS • FLOW COLORIMETERS • LEAK DETECTORS • OXYGEN ANALYZERS • DENSITY BALANCES

nique of planned shutdowns for entire units for several years. However, this way of finding leaks into flare lines leaves much to be desired. Often, the unit must remain off stream for an hour or more before the effect of the shutdown shows in the amount of flaring—that is, if the right unit has been selected for the test. If it is not the offending unit, several shutdowns, and a resulting accumulation of many hours of off-stream equipment, could result.

Sometimes, even though the unit shut down is the offender, instability in other units feeding the same flare stack can result in misleading information or none at all.

A newly developed gas-rate metering instrument will help Esso pinpoint the location of equipment leaking into the flare gas system.

Until recently, refineries using constant back-pressure-type relief valves (as Bayway does) hand no satisfactory way of metering gases flowing through flare-gas gathering lines, according to Bayway spokesmen.

The problem is that no appreciable pressure drop can be allowed in flare-gas lines connected to constant back-pressure relief valves if the valves are to operate properly and safely. This eliminates the use of displacement-type gas meters.

Working with Anemostat Corp. of America, New York City, Esso found an excellent hot-wire anemometer being used to check and control the performance of ceiling diffusers used for air conditioning and heating systems. After some discussion, Anemostat Corp. agreed to work with Esso to develop an industrial process model, now called the Industrial Anemotherm Meter.

Prior to the Anemotherm, the Conservation Control Division at Bayway was limited to rough estimates of flare quantities. At one time the flare rate vs. flame length was calibrated so that rates for all the flare stacks in the refinery could be estimated.

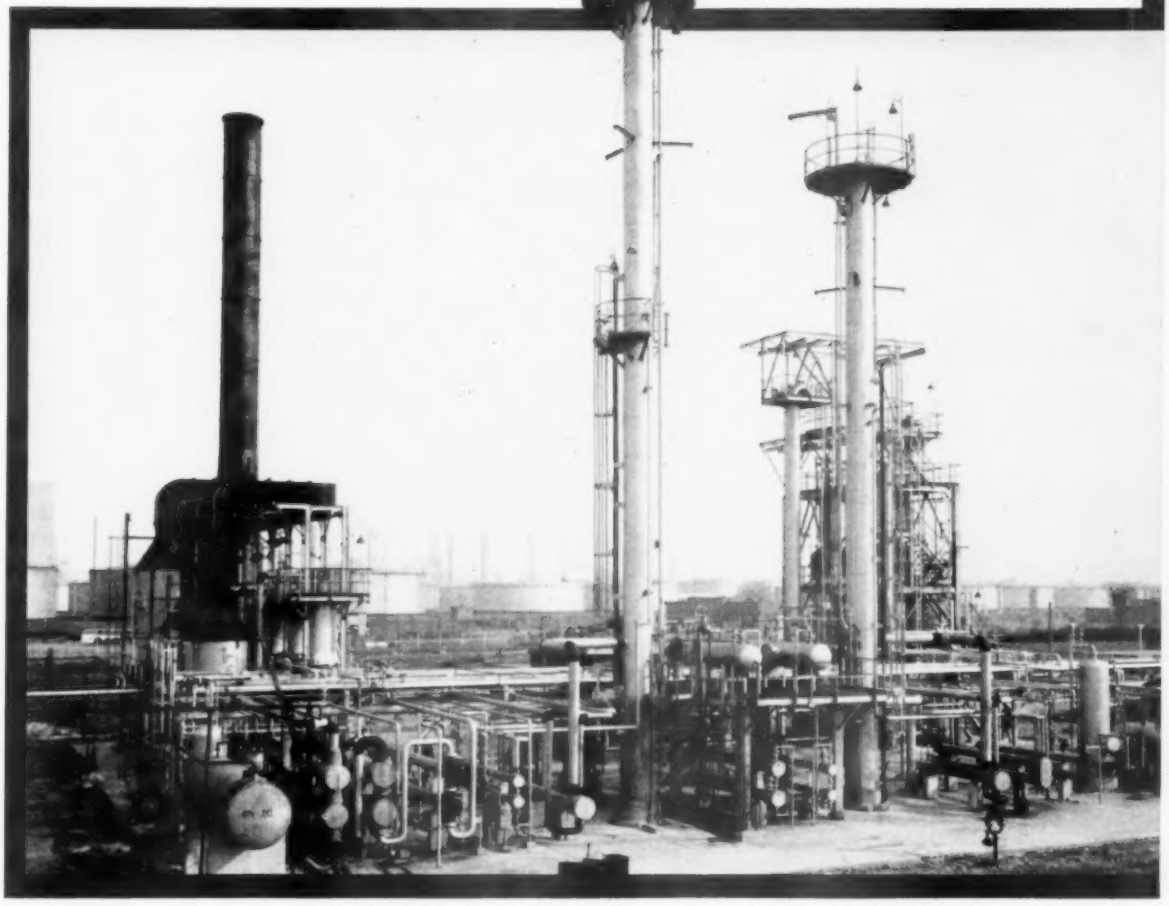
A hot-wire anemometer actually measures temperature. However, the temperature it measures is related to the thickness of the film of gas surrounding the measuring element (and its heat transfer coefficient), which, in turn, is related to the velocity of the gas flowing past the measuring element.

The Anemotherm has a sensitive probe made of two loops of stainless steel tubing. Inside the tubing is a fine mandrel (wire), around which ribbon resistance wire is wrapped. Total length for the tubing loops is about 1½ in.

The probe (consisting of two 90-

In Britain . . .

ANOTHER JOB WELL DONE by PROCON



At home or abroad, wherever you need to build, Procon offers the finest construction service. This 800 B/SD Platforming® unit was built by Procon (Great Britain) Limited. The unit was designed to produce an 85 to 90 RON clear product from Kuwait naphtha or a 90 to 95 RON clear blending component from mixed Peruvian naphthas. The Platformer construction included a prefractionator to separate naphtha from full-range gasoline or to prepare a 53-150°C. naphtha for Platforming feed from Peruvian stock.

In England, as in all other parts of the free world, Procon is serving the petroleum, petrochemical and chemical industries with better plant design and construction.

If you want a job done, and done right, anywhere in the world . . .

Call on PROCON

PROCON *Incorporated*

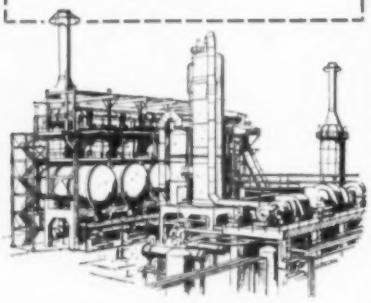
1111 MT. PROSPECT ROAD, DES PLAINES, ILLINOIS, U. S. A.

PROCON (CANADA) LIMITED, TORONTO 18, ONTARIO, CANADA
PROCON (GREAT BRITAIN) LIMITED, LONDON, W. C. 2, ENGLAND
PROCON INTERNATIONAL S. A., SANTIAGO DE CUBA

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

on stream in the United States

ANOTHER
HOUDRY
DEHYDRO
PLANT



The Firestone Tire & Rubber Company
Orange, Texas

For the production of butadiene at its new Orange, Texas, plant, Firestone selected the Houdry Catalytic Dehydrogenation Process—the only commercial single-step process for transforming normal butane into butadiene.

This Texas installation has a design capacity of 40,000 ton yr of butadiene. It joins the others designed and licensed by Houdry which, from the time the synthetic rubber industry changed from governmental to private control, have accounted for over 50% of all new U. S. butadiene capacity.

For full information about Houdry Processes and Catalysts —and their applications to your company's particular problems—write to:

HOUDRY
PROCESS CORPORATION
1528 Walnut Street, Philadelphia 2, Pa.
Pioneer in Catalytic Processes

degree-oriented loops) is connected to a Wheatstone-type balancing bridge. One loop compensates for the effect of changes in temperatures in the measured fluid.

A similar instrument, which uses about ten times the current of the Anemotherm, was tested under its normal power requirements many times by breaking wires in an explosive atmosphere. Not one explosion resulted, showing that this type of instrument is safe in explosive atmospheres.

As to durability and reliability, an Anemotherm has been in service at Bayway for five months without repair or calibration. As far as can be seen, it still works accurately.

Range for the Anemotherm is from 5 to 2,500 ft. per minute of gas velocity. Over half of the scale on a circular chart (starting from the outside) is for the range from 5 to 100 ft. per minute.

The remainder of the range is compressed into the inside half of the chart. Esso has found this arrangement to be of advantage, as most of the flare line laterals have gas velocities of about 5 to 20 ft. per minute.

Esso plans to install a large number of the new gas-metering probes in major flare-line laterals at the Bayway refinery.

From 20 to 31 Anemotherms will be placed in various "major" laterals ahead of the seal drums on the flare stacks.

At present, a few Anemotherms are being used downstream from the flare stack seal drums. These are 20 to 50 ft. up on the stacks, to prevent the chance of seal-drum water disrupting proper operation of the probes.

A 3-to-8-point recorder will be used on the lateral probe installations. While the recorder costs more than a single-point one, it will give a lower cost per probe installation.

A fixed installation for a single Anemotherm probe costs about $1,200 to $1,300. This includes the cost of the probe (less than $300), the cost of a circular chart single-point recorder (about $600), and the cost of some modification to make the recorder drive off the Anemotherm ($256).

Bayway personnel have high hopes that these probes will aid materially in finding and repairing leaks into the flare-gas line quickly.

What's New / IN PETROLEUM PROCESSING

Consumers' Cooperative Refineries, Ltd., plans to spend $1.3-million for a coking unit at its Regina (Saskatchewan) refinery.

The coking unit will have a maximum crude throughput of 3,000 b/d. Product will be about 145 tons per day of coke and about 1,650 b/d of liquid products.

Work on the unit is expected to start early in January, 1958.

•

Spain's first Platformer has gone on stream at the refinery of Refineria de Petroleos de Escombreras, S. A.

Capacity of the unit is 11,000 b/d. Product will be a 90-octane (clear) reformate, derived by processing straight-run naphtha from Middle East crude, principally Saudi Arabian.

•

Caltex S.A.F., French affiliate of California Texas Oil Co., Ltd., has placed a UOP fluid catalytic cracker on stream at Bec d'Ambes, France.

The cracker has a design capacity of 5,150 b/d to process atmospheric and vacuum gas oils derived from Middle East crudes.

•

United Farmers of Alberta Cooperative, Ltd., is considering building its own refinery in Alberta.

Details of size and location are not yet available. Financial aspects of the project are now under consideration.

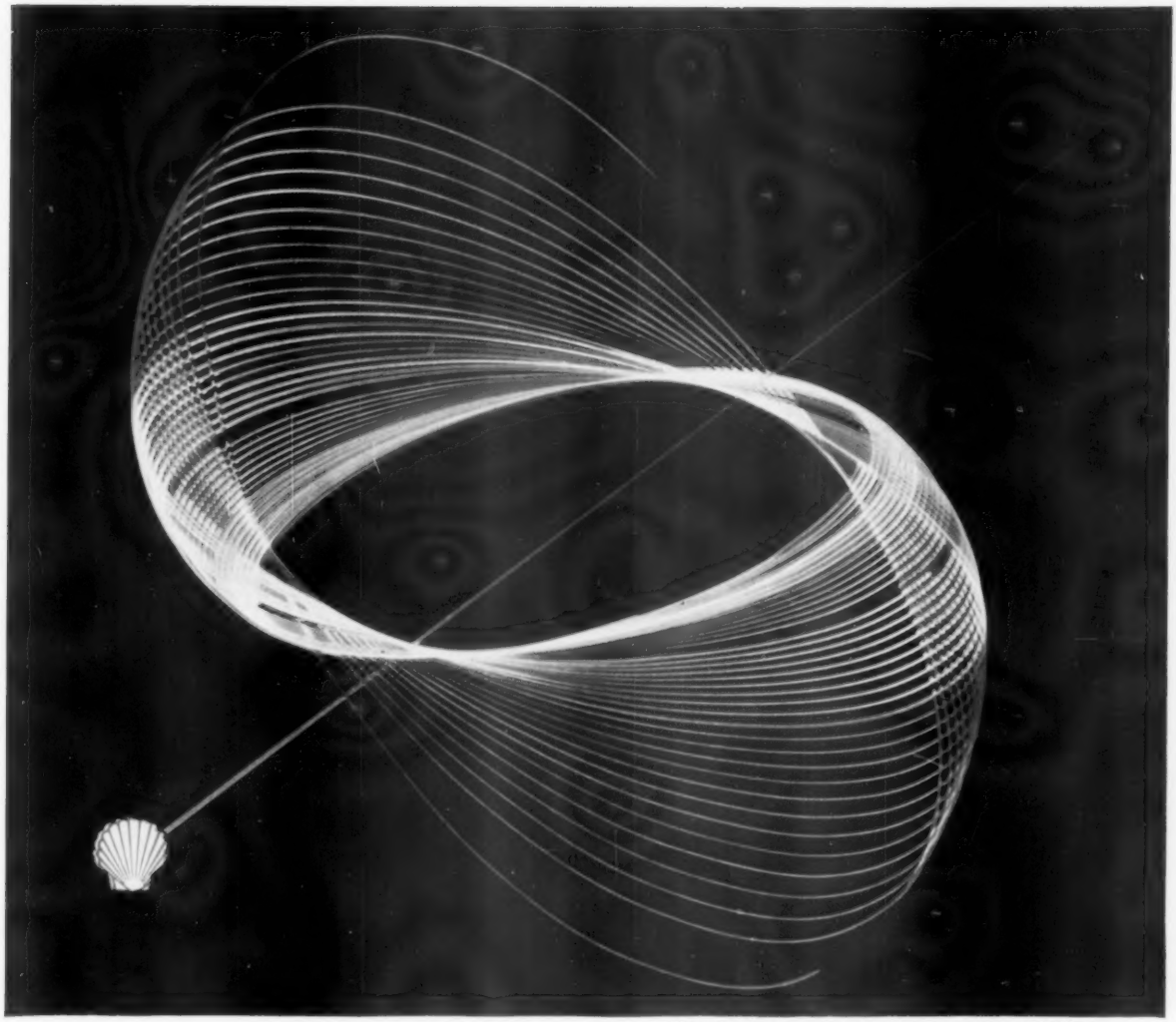
During 1956, the company marketed over 25-million gal. of gasoline and fuel oil, and over 200,000 gal. of motor oil under its "Maple Leaf" trademark.

Imperial Oil Ltd. now supplies United Farmers Cooperative for its 128 Alberta outlets.

•

Foster Grant Co. is expanding its styrene monomer plant at Baton Rouge, La.

The plant's new capacity will be 105-million lb. per year. Cost of the expansion will be "several millions."



"Cyclic Planning," an impression by Max Richter

BUYING SOLVENTS?

Costs go down with planned delivery cycles from a single source

When you make Shell your headquarters for solvents, you can keep costs down by planning your delivery cycles. For when you are buying less than tank car quantities of several different solvents, you can combine your orders to make up a full tank car and a single delivery can be made at bulk prices for all.

Compartmented tank cars and tank trucks permit multi-product deliveries promptly from conveniently located Shell stock points. And when you order solvents from Shell Chemical you can be sure that the products you receive will be uniformly high in quality, meeting or exceeding the highest purity standards set by industry.

Our technical service staff is prepared to assist you in the solution of product problems that may arise. Write for specifications and quotations on particular solvents.

- Acetone
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Mesityl Oxide
- Ethyl Amyl Ketone
- Diacetone Alcohol
- Ethyl Alcohol
- Neosol® Solvent
- Isopropyl Alcohol
- Methyl Isobutyl Carbinol
- Hexylene Glycol
- Secondary Butyl Alcohol
- Isopropyl Ether

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION, 380 Madison Avenue, New York 17, New York

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited • Montreal • Toronto • Vancouver

SHELL

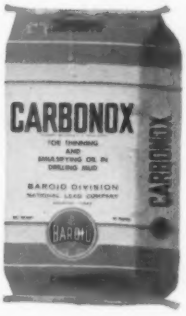
BAROID

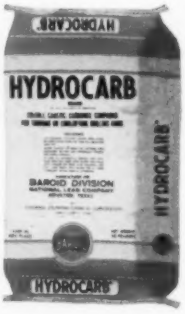
OLD FRIENDS (and new)

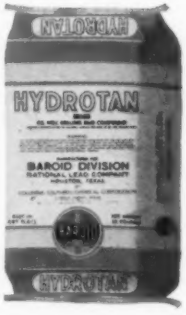
Ask for these dependable mud products in the new colorful bags at all Baroid distributers.

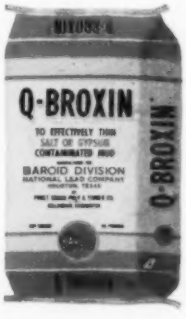
More than ever you get the most complete line of mud products from Baroid—more than 50 types and grades. The *new dress* look of our red-yellow and black bags make these products easier to find, to count and to handle.
The products in these *new*, colorful bags are your *sure sign* of top quality, field tested mud materials.

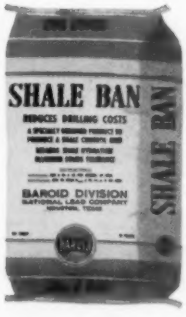
8704

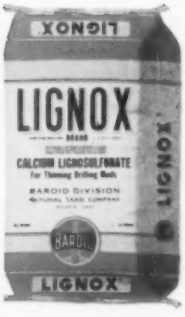












BAROID

IN NEW DRESS

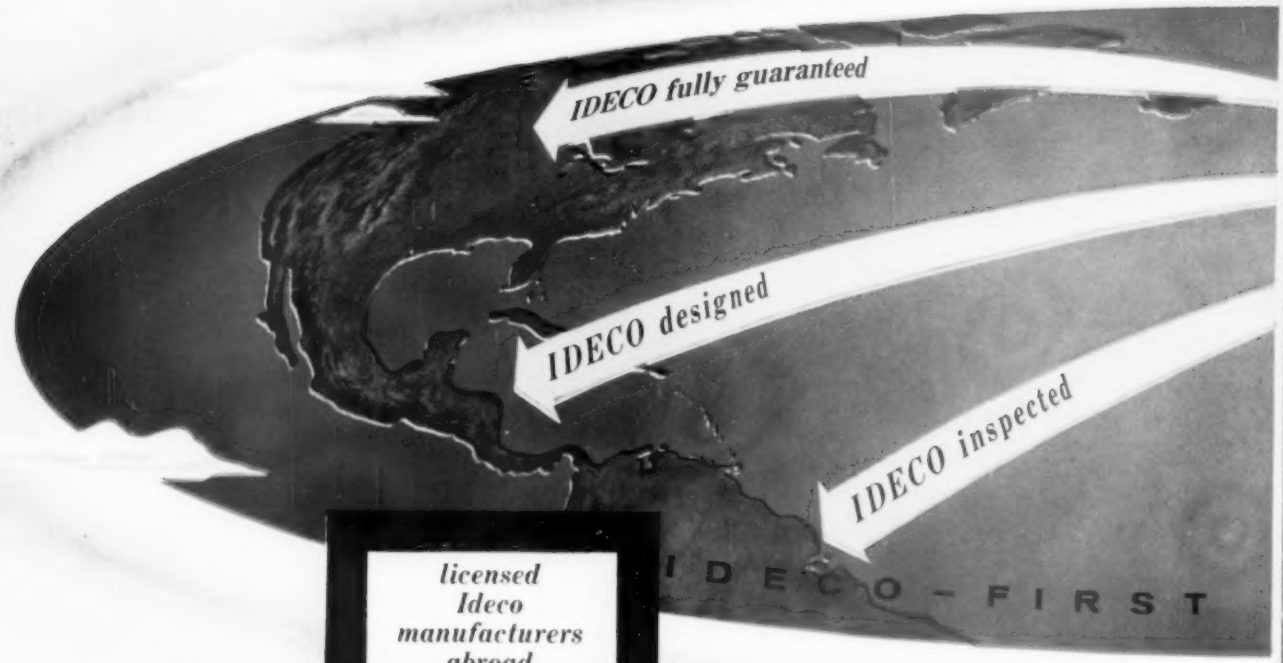
. . . and there are even more Baroid products than these you see on these pages!

BAROID DIVISION • NATIONAL LEAD COMPANY

Main Office: P. O. Box 1675, Houston 1, Texas

BAROID

Now Buy IDECO® Rigs



licensed Ideco manufacturers abroad

England

WOODFIELD HOIST

Italy

NUOVO PIGNONE

France

BATIGNOLLES-CHATILLON

Austria

SCHOELLER-BLECKMANN

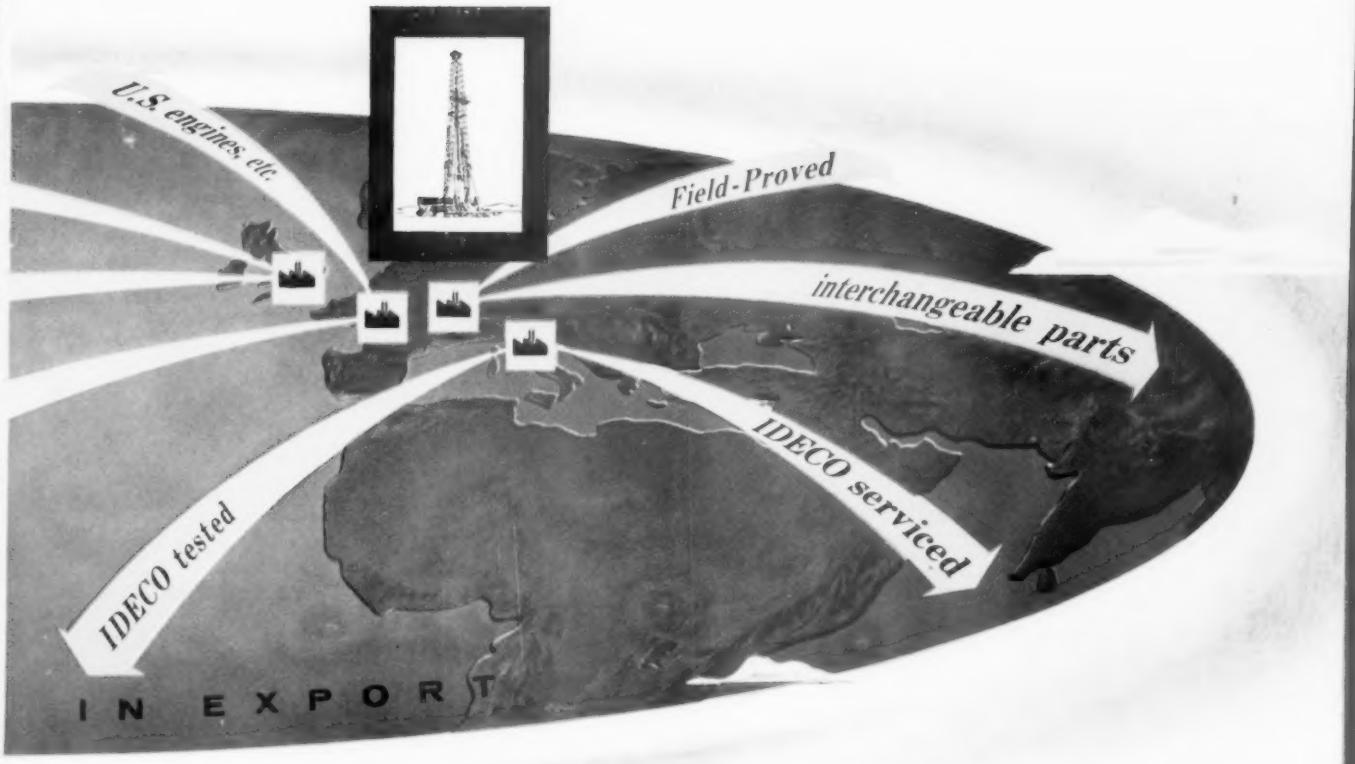
HIGHEST U.S.A. QUALITY . .

4 MANUFACTURERS

YOUR CHOICE OF CURRENCY

Five years ago Ideco launched a program, through its European affiliate Dresser A. G., to make it more convenient for drillers the world over to buy the equipment of their choice with the currency of their choice. Now, four outstanding European manufacturers are licensed to furnish you complete drilling equipment – designed, inspected, tested, serviced and fully guaranteed by Ideco. The quality is the same that made Ideco foremost in the export field. Many components are actually made in the United States. All components are completely interchangeable with other Ideco equipment. Think what this means to your foreign operations – equipment you *know* is tops – replacement parts close at hand – soft currency purchases – guaranteed performance! To get the full story, include an Ideco proposal in your plans.

... Made in Europe!



. . available for soft currency!

WORLD-WIDE SALES AND SERVICE

HEADQUARTERS — 31st Floor, Republic National Bank Building, P. O. Box 1331, Dallas 21, Texas — Telephone RIverside 1-1031, Cable IDECO.

MAIN PLANT, U.S.A. — 1800 Laurel Ave., Beaumont, Texas.

LICENSED MANUFACTURERS — *Austria:* Schoeller-Bleckmann Steelworks, Vienna; *England:* Woodfield Hoist, Rochester, Kent; *France:* Batignolles-Chatillon, Paris; *Italy:* Nuovo Pignone, Florence.

EXPORT OFFICES — Dallas and Houston, Texas; New York City, New York; Long Beach, California; London (Ideco-Woodfield), England; Paris, France; Rome, Italy; Rio de Janeiro, Brazil; Edmonton, Alberta, Canada; Mexico, D. F., Mexico.

CALIFORNIA OILFIELD SALES — Ideco, Inc., Long Beach, California.

LATIN AMERICA — Sales Representative, Dresser International, Inc. — *Argentina:* Buenos Aires; *Brazil:* Rio de Janeiro; *Mexico:* Mexico, D. F.; *Peru:* Lima; *Venezuela and Colombia:* (A-Z Export, representative) Maricaibo, Puerto la Cruz, Bogota; *Trinidad:* San Fernando.

EASTERN HEMISPHERE — Sales Representative, Dresser A. G. — *Austria:* Vienna; *Egypt and Middle East:* Lebanon, Beirut; *France:* Paris; *Germany:* Hannover; *India:* New Delhi; *Italy:* Rome; *North Africa:* Algeria, Algiers; *Spain:* Madrid; *Turkey:* Istanbul; *United Kingdom and Holland:* London (Ideco-Woodfield); *Yugoslavia:* Belgrade.

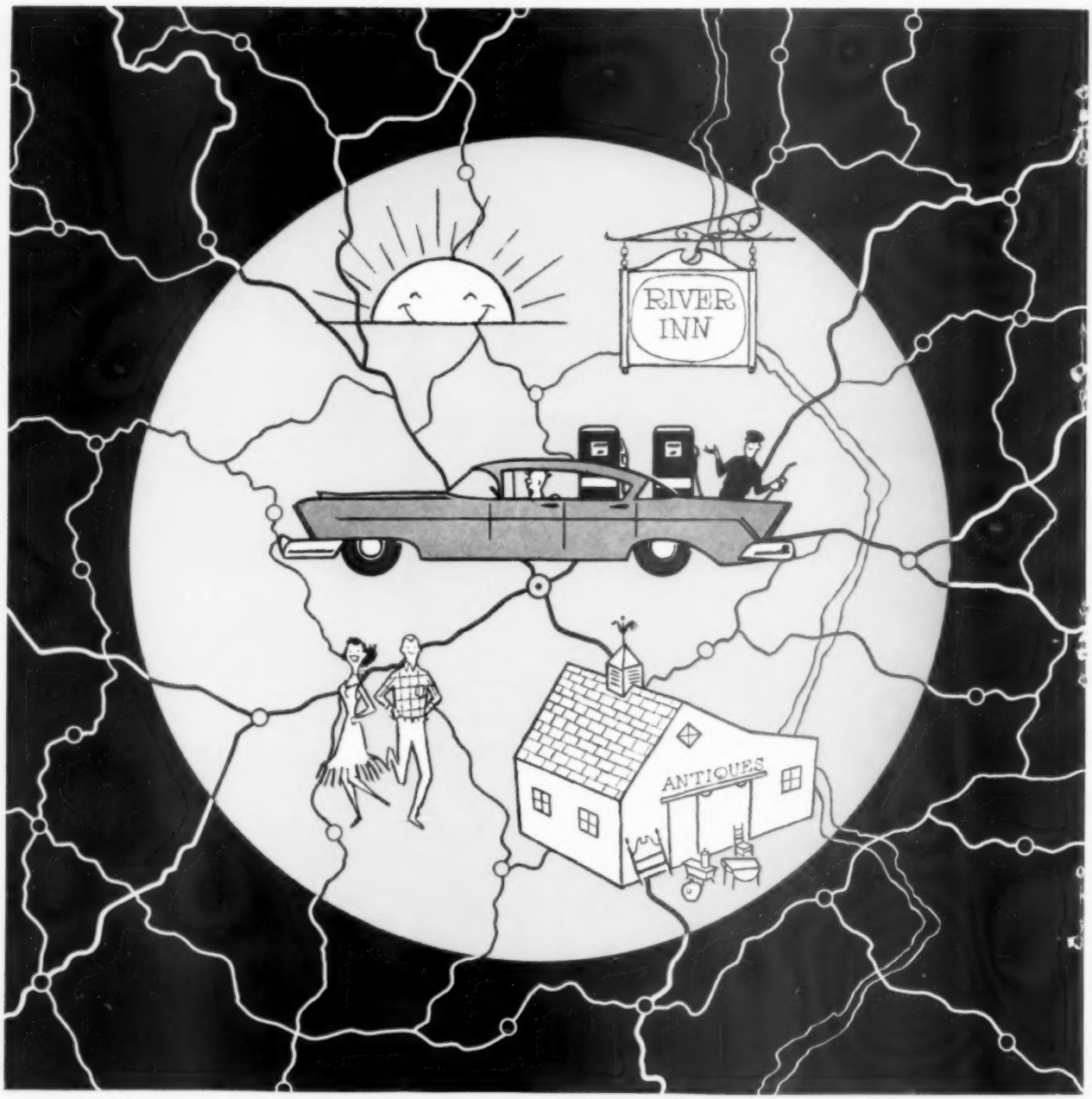
Address inquiries to

IDECO Inc.

P. O. BOX 1331 • DALLAS 21, TEXAS

"MAGIC CIRCLES"

are keys to extra s



S”

a service station business

The more **extra** driving people do for pleasure, the **more extra business** you get at your stations.

To stimulate this extra business is the purpose of the “Magic Circle” campaign Ethyl Corporation will direct to your customers throughout 1958.

There will be full-color ads in top national magazines. There will be a publicity program to turn the spotlight on the fun of going by car.

Just ask any Ethyl representative to tell you about this new market-expansion idea and what it can do for you.

ETHYL®
ANTIKNOCK COMPOUND
ETHYL CORPORATION

ETHYL CORPORATION

New York 17, N. Y.

Tomorrow's Progress Planned Today

AMERICAN PETROLEUM INSTITUTE

37TH
ANNUAL MEETING

Conrad Hilton Hotel
Palmer House
Chicago, Illinois
November 11-14, 1957

Dresser pays tribute to the members of the American Petroleum Institute for their many contributions to the progress of our vital oil and gas industries.

THE DRESSER INDUSTRIAL TEAM SERVES THE GROWING OIL

the Dresser Badges of Merit plus+

CLARK

CLARK BROS. CO., Olean, New York —Gas turbines, engines, and reciprocating, centrifugal and axial flow compressors—gas, steam, electric and diesel driven.

DRESSER IDECO

DRESSER-IDECO COMPANY, Columbus, Ohio—Radio and television broadcasting towers, steel buildings, aircraft hangars, electric power substations.

DRESSER MANUFACTURING DIVISION

DRESSER MANUFACTURING DIVISION, Bradford, Pa.—Pipe line couplings, pipe repair sleeves and clamps, weldments, forgings, welding fittings, flanges, rings.

GUIBERSON

THE GUIBERSON CORPORATION, Dallas, Tex.—Swabs, packers, anchors, workover equipment—drilling heads, blowout preventers, tubing blocks, hooks, swivels, kellys, savers, unions. Gas lift equipment. Molded rubber products.

IDECO

IDECO, Dallas, Tex.—Hydrair* and Power Rigs; Full-View* Masts; substructures; single, dual and Drive-In Rambler Rigs; blocks, swivels, rotaries; mud pumps; petroleum equipment and supplies.

LANE-WELLS

LANE-WELLS CO., Los Angeles, Calif., Houston, Tex., Oklahoma City, Okla.—Electric and Radioactivity Well Logging, Koneshot* perforating and bullet perforating, packers and bridging plugs.

Magcobar

MAGNET COVE BARIUM CORP., Houston, Tex.—Magcobar* and Magcogel* drilling muds and other specialized oil well drilling fluids and chemicals.

PACIFIC

PACIFIC PUMPS, INC., Huntington Park, Calif.—Centrifugal pumps for refineries, power stations, pipelines, and chemical plants; plunger pumps for oilwells

ROOTS-CONNERSVILLE

ROOTS-CONNERSVILLE BLOWER DIVISION, Connersville, Ind.—Rotary positive blowers, gas pumps, centrifugal blowers, exhausters, vacuum pumps, and positive displacement meters.

Security

SECURITY ENGINEERING DIVISION, Dallas, Tex., Whittier, Calif.—Rock bits, reamer rock bits and hole openers; reamers, casing scrapers and Neo-Red rubber stabilizers.

SIE

SOUTHWESTERN INDUSTRIAL ELECTRONICS CO., Houston, Tex.—Seismograph systems and instruments—electronic, electro-mechanical. Computers—analog and digital; recording systems. Special transformers, reactors.

WELL SURVEYS

WELL SURVEYS, INC., Tulsa, Okla. —Nuclear and electronic research and development for the petroleum and other industries. Originators of radioactivity logging.

*Trademark registered

put this DRESSER *plus+* team to work for you!

You receive a bonus of extra value whenever you are served by any one of the Dresser companies. *Men with imagination* provide the research, engineering, manufacturing and service applications for the particular specialties of each Dresser operating unit. All Dresser companies work together with their combined experience and facilities to form the world-wide Dresser industrial team. This inter-company teamwork offers a bonus in greater experience and technical knowledge – backed by the extensive Dresser facilities – in the customer's specific industry. This intangible but important factor is known the world over as the Dresser plus+ . . . the mark of superior equipment and services for the oil, gas, chemical, electronic, and general industry.

Dresser's world-wide engineering experience in many industries plays a major role in the creation of new developments and improved technological methods. No other single company provides the same broad range of equipment and services. The Dresser plus + is a symbol for the superior quality of equipment and technical services which have become the standard of comparison in industries the world over!

DRESSER INDUSTRIES, INC.

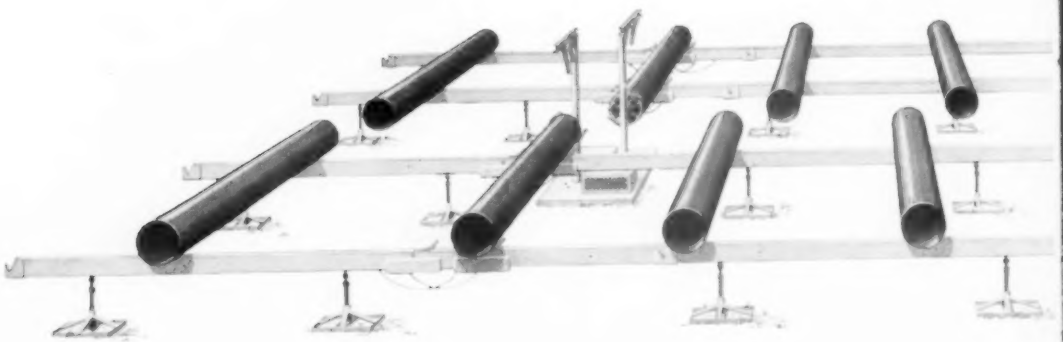
EQUIPMENT AND TECHNICAL SERVICES

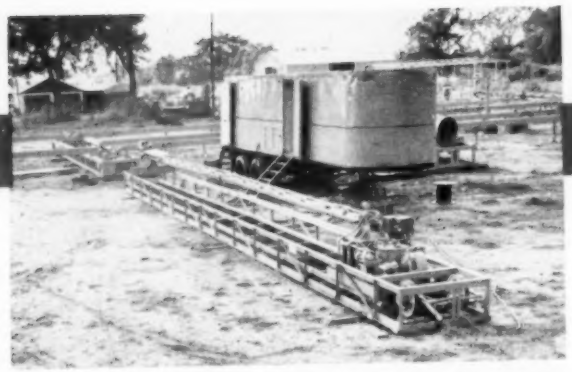
OIL • GAS
CHEMICAL
ELECTRONIC
INDUSTRIAL

POST OFFICE BOX 718 • REPUBLIC NATIONAL BANK BUILDING • DALLAS 21, TEXAS

OIL, GAS, CHEMICAL AND ELECTRONIC INDUSTRIES — EVERYWHERE

CROSE ENGINEERING BRINGS YOU...



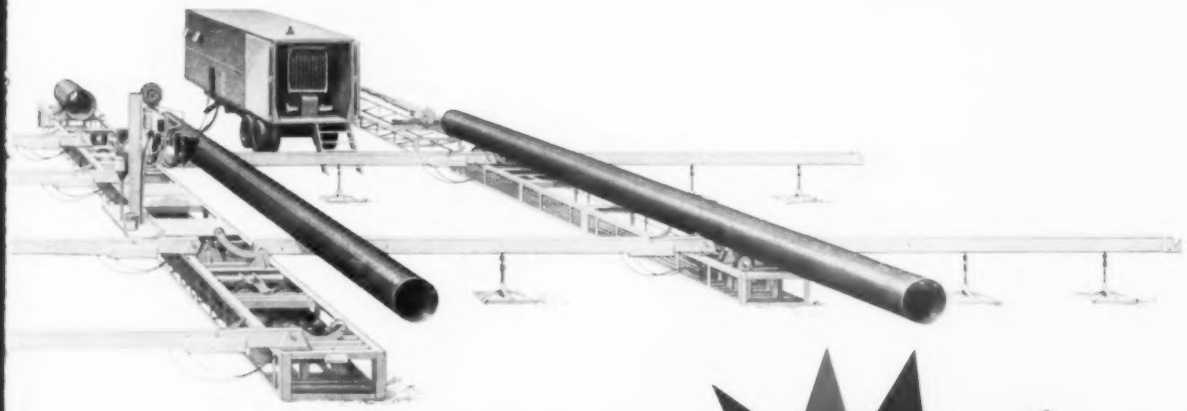


Through the outstanding facilities and skilled specialists provided by Crose engineering, new and important equipment now is available to the pipeline industry. Crose, the recognized leader in its field, in collaboration with another great industry name, has designed and perfected a fully automatic double jointer for large diameter pipe. This highly portable equipment, set up in strategically located yards, brings finest shop techniques to the field through controlled welding conditions never before possible.

The CROSE-PRICE-O-MATIC fully automatic double jointer speeds up pipe laying — only half as many manual welds now required out on the line. Maximum automation of pipe handling equipment and highest quality automatic welding — even in sub-zero weather — effect tremendous savings in time and labor, which means greater economy and efficiency for the pipeline industry.

. . AUTOMATIC PIPELINE WELDING

UNDER CONTROLLED CONDITIONS FOR MAXIMUM QUALITY AND ECONOMY



double jointer

CROSE-PRICE-O-MATIC

fully automatic

Pipe is rolled onto skidways to grinding station where 75% of the bevel is ground off by special electric powered grinding units. Pipe then is rolled to welding station where line-up and handling are accomplished hydraulically. At the automatic welding station — including synchronized turning rollers — two outside beads are run. Pipe is rolled to the next rack for the inside bead, which is quickly achieved by a boom that projects welder and welding head into pipe. Turning rollers revolve pipe around welder and boom. Both outside and inside beads are run by submerged arc welding heads. For 30-inch pipe the production rate is ten to twelve welds per hour with the Crose-Price-O-Matic double jointing process. Welding time varies slightly with the size of pipe. Handling time into and out of welding fixture remains constant. This equipment is designed to handle pipe 24" to 36" in diameter.

M. J. Crose MANUFACTURING COMPANY, INC.

2715 DAWSON ROAD
PHONE MAdison 6-2171
TULSA, OKLAHOMA

for further information, write for Bulletin No. AWI-957.

Now We Know

Dear Sir:

In answer to C. M. Burnett's question in "Letters," Oct. 11, 1957, "Who is he?", he's Bob Hiles, Ohio Oil geologist working southwest of Rawlins, Wyo. The photo is from Ohio Oil Co.'s files.

W. L. SKIPP
OHIO OIL CO.
CASPER, WYO.

. . . I ran across the photograph of the "mystery man" in PETROLEUM WEEK's Oct. 11th Letters page.

An inspection of our photo files reveals that it is Ohio Oil geologist Bob Hiles, of our Casper production division. He is plane tabling near Black's Fork, Sweetwater County, Wyo. Bob wears a collegiate crewcut, receding slightly. Perhaps you can pass this word along to Mr. Burnett.

HERBERT H. KISTER, JR.
PUBLIC RELATIONS DIVISION
OHIO OIL CO.
FINDLAY, OHIO

We have passed the word along to Mr. Burnett.

It's A Topsy-Turvy World

Dear Sir:

In your Oct. 4th issue, there is an article on Alberta oil and gas fields that is somewhat puzzling [PW—Oct. 4'57,p18].

Your map showing oil and gas fields within the province was at first thought to be futuristic, and there was immediate contemplation regarding new land plays over these areas. Fortunately, keener minds discerned that the plate showing the oil and gas fields had been superimposed on the map of Alberta upside down. So our activity was brought back to normal.

Your magazine is well read and well thought of within the company and we realize that mistakes can be made. However, we are like Texans, we cannot appreciate this being done to Alberta.

Yours for bigger and better articles on Alberta's growing oil industry.

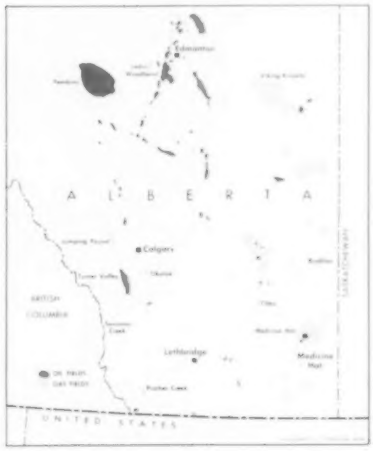
R. J. ROBB
WESTERN LEASEHOLDS LTD.
CALGARY, ALTA.

. . . the gremlins seem to have played tricks on your Alberta map. The overlay showing the oil and gas fields apparently has been reversed so that Pembina field is where Medicine Hat should be, and Redwater has been shifted into Montana.

Typographical errors are such a rarity in your excellent publication that I couldn't resist a note about this one.

EARLE MARSHALL
ASS'T. VICE-PRESIDENT
EMPIRE TRUST CO.
NEW YORK, N. Y.

We caught the error just too late to make a change. So here it is right side up.



Stocking Tows: Not New

Dear Sir:

In your Oct. 4 issue, you state, and we quote: "Dravo Corp. is trying something different in shipbuilding. It is stocking towboats—building them before orders have been placed."

We wish to advise that we at Equitable Equipment Co. have been building stock tugs for approximately 20 years, so the idea of stocking vessels (building them before they are sold) is certainly not new to the industry.

Some old literature shows that we have been building stock tugs since the early 30s. One of our stock tugs sold to the T.V.A. approximately 1933 is still in service.

We have the highest regard for the Dravo Corp., and, while our vessels are not 3,200 hp., we believe that we established a "first" in building stock tugs many years ago. Best wishes to your excellent publication.

W. P. OSTER
VICE-PRESIDENT, SALES
EQUITABLE EQUIPMENT CO.
NEW ORLEANS, LA.

Highest Well Is in Peru

Dear Sir:

In your Special Report on drilling, you say that a Richfield well in Wyoming that is 10,796 ft. above sea level is "the highest well ever drilled in the Western Hemisphere" [PW—Oct. 11 '57,p62].

Having recently returned from Lake Titicaca, I would like to point out that an oil well is located at Pirin, Peru, at over 13,000 ft.

JACK KRATCHMAN
ROCKVILLE, MD.

Orchid

Dear Sir:

Congratulations on your hard-hitting editorial, "Oil and the Public: A Poor Relation" [PW—Oct.4'57,p58]. This is exactly the kind of tough, honest self-criticism that is sorely needed.

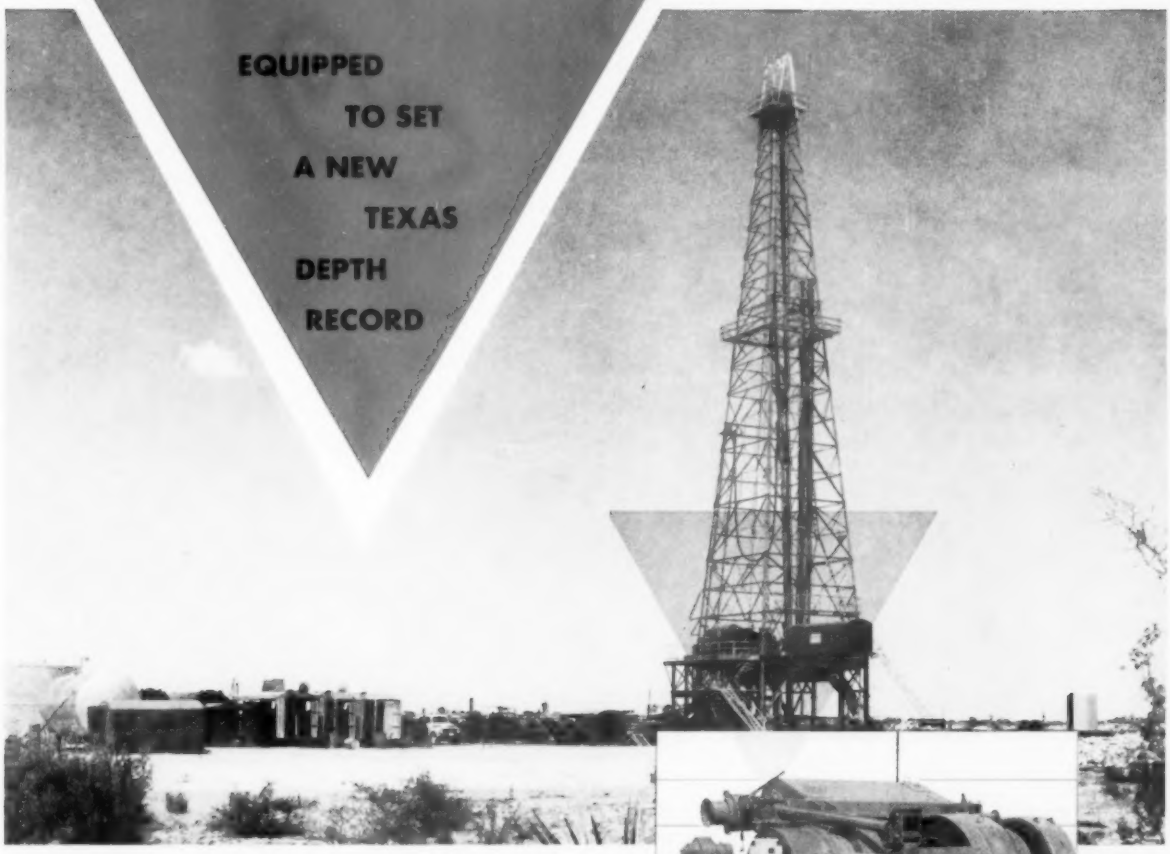
Except for a slight inaccuracy, I also liked your piece on Oil Progress Week [PW—Oct.4'57,p39]. Money for the scholarships is not solicited from the public, but is contributed by the dealers and the jobbers themselves, with an occasional assist from suppliers. But in no case is the general public asked for contributions.

PHILIP C. HUMPHREY
ACTING DIRECTOR
DEPT. OF INFORMATION
AMERICAN PETROLEUM INSTITUTE
NEW YORK, N. Y.

PETROLEUM WEEK will publish from time to time comments from readers on timely, pertinent subjects. Expressions of opinion are welcomed; they should be kept as brief as possible.

Address all such correspondence to LeRoy Menzing, Editor, PETROLEUM WEEK, 330 W. 42nd St., New York 36, N. Y.

EQUIPPED TO SET A NEW TEXAS DEPTH RECORD



THE U-1220-EB ELECTRA-FLOW DRAW WORKS

The rig now drilling toward a new Texas depth record of 22,000 ft. in Pecos County is equipped with a U-1220 electric draw works.

The choice of equipment for this deep test was of primary importance. In selecting the U-1220 draw works, the contractor has assured the operators speed of operation, minimum down time, and dependable performance.

Simplicity of operation and ease of maintenance are design characteristics of the unit. The U-1220-EB Electra-Flow Draw Works is available in a single or split package. Included among other important features are extra large diameter and wide spooling drum, large braking capacity, and centralized lubrication.

You can depend upon a Unit Rig draw works to turn in an outstanding performance—anywhere—because it is "designed for the job."

UNIT RIG and EQUIPMENT CO.
Box 1889, Tulsa, Okla.
Export Sales: MID-CONTINENT SUPPLY CO.
45 Rockefeller Plaza, New York 20, N. Y.
Cable: MIDUNITRIG

No. 3 in a series . . . Reed Rock Bit **Firsts** in Famous Fields

Reed Rock Bits

BEST IN 1930
BEST TODAY!

During the early days of the unprecedented East Texas oil boom, Reed introduced the first rock bit having roller bearings supporting the replaceable rolling cutter assemblies. Today all popular-size bits with rolling cutters utilize roller bearings, but let's go back to those eventful days in East Texas.

In 1930 the quiet rural folk of East Texas wore long faces. A drouth had ruined their usual crops of cotton, sweet potatoes and corn, and their poultry and truck crops were being dumped on a pitiful depression market. They all fervently hoped for an oil field to solve their hardships.

It's little wonder that they watched with great expectancy as C. M. "Dad" Joiner's crew rigged up and spudded into Rush County's iron-colored soil near Overton. Enthusiasm was dampened by the abandonment of the first two wells. But on October 2, approximately 8,000 people assembled for the "drilling-in" of the No. 3 Daisy Bradford, which had shown earlier signs of oil. Cars and hacks backed up for miles along the roads—a carnival atmosphere prevailed with soda pop and peanut vendors hawking their wares. Finally on October 3, 1930, the well blew in throwing a spray of gas and oil over the crown block. This was it—a forest of yellow pine derricks appeared and Tyler, Kilgore, Longview, Gladewater, Henderson and Overton caught the oil fever in earnest. During the first fourteen years, the "Black Giant" produced more than twice the oil of any field in U. S. history.

And playing prominent roles in drilling the more than 25,000 East Texas oil wells were Reed roller bits. Just as the Reed 1930 model roller bearing rock bit set the pace for drilling performance *then*—Reed Y Bits, advanced 3-cone rock bits, are setting the drilling efficiency pace *today*.

BEST IN 1930 . . .

First Rock Bit with roller bearings supporting the rolling cutters in replaceable cutter assembly — 1930.

BEST TODAY . . .

REED Y BIT

FREE REPRINT

This is the third of a series of four paintings on the history of famous oil fields. To obtain your FREE 17 x 14" full color prints suitable for framing of the entire series, send your request to Department H, Reed Roller Bit Company.

EAST TEXAS BLACK GIANT · 1930

Oil shoots over the crown block of the No. 3 Daisy Bradford, discovery well which touched off the epochal East Texas boom on October 3, 1930.

REED ROLLER BIT COMPANY

HOUSTON 1, TEXAS

Inflation? It Depends on Where You Look

Inflation—a rising price level—has been very much the subject of public debate and concern. But rising prices have not been everywhere in evidence. As a matter of fact, some very important prices at the wholesale level have actually been falling through most of this year—especially among industrial commodities.

Take oil, for example. Although the prices of petroleum and its products shot up through the Suez crisis, they fell rather steadily from February on, with only a slight upturn in recent weeks. (And, as they are a part of the price index of all industrial commodities, they have contributed to its leveling off, as shown in the chart.)

Copper is another important item whose price has been slipping. Nonferrous metals as a whole have declined about 17 points just since last January. Even processed food prices have eased off since July.

Although steel prices rose and pushed up the iron and steel index from 164 in January to around 170 now, the rise was not enough to keep the index of all industrial commodities on its 1956 upward path.

The net result has been a halt in the two-year rise in the prices of all industrial products. In its place has appeared an almost level trend for the last nine or ten months. (Only in the past two or three months has there been any strength in these prices—and only a few decimal points at that.)

* * * *

If this is the situation, why all the talk about inflation? The answer is, of course, that people are talking about rising prices in quite another place. As any housewife knows, it's the "cost of living" that is steadily rising. That means consumer prices—not wholesale or industrial.

Here is what has been happening to the cost of living. It remained almost level for about four years, until 1956, when it started its recent, frightening upward march—frightening to those living on pensions and other fixed income.

However, a close look into the four-year level of the cost-of-living index reveals that there were contradictory price changes going on below the surface. Food prices, for example, were falling, while most other prices were rising. But around the beginning of 1956, food prices, too, turned up, and so did the cost of living.

The importance of this change, and others like it, is made clear by looking at the makeup of the index. It's what the Dept. of Labor figures it costs an average family of four to buy the goods and services it needs for its well-being. Thus, it includes the retail prices of such things as food, housing, appliances, clothing, transportation, medical care, personal care, reading,

recreation, and other services—all weighted in accordance with the percentage of income spent on each item. Food accounts for 28% of the total cost-of-living index, housing for another 33%. Gasoline accounts for only 2.4%, lubricating oil 0.2%, and fuel oil (a part of housing) 0.5%.

* * * *

Here's the important point for the oil industry: Since petroleum products occupy such a small place in the cost of living index—only 3.1%—a rise in their prices would have relatively little inflationary effect as far as the consumer is concerned.

It is the rise in the prices of food, housing, and services that gives the cost of living such a big boost.

And the outlook is that the cost of living—consumer prices—will continue to rise. Consumers have more disposable income—income after taxes—than ever before. And they are spending it at a great clip. Total retail sales have increased, with the early fall figures showing sales 5% over what they had been a year earlier.

Perhaps consumers will begin to balk at higher retail prices. There has been evidence of this in some consumer surveys. It is doubtful, however, that such reluctance to buy will do much more than slow down just a bit the upward push in the cost of living.

The talk of inflation will continue as the cost of living climbs upward—thanks mostly to increased food costs, higher rents, and more expensive services. But it is very doubtful that this rise will be reflected in substantial rises in the prices of most industrial commodities—at least not in the immediate future.

With Magcobar on your well . . .

you can cut the time per well... the cost per foot

You can see the effect each day of a faster rate of penetration in the drilling report. Part of the credit for faster penetration goes to the quality of the mud program.

When you pay close attention to the mud circulation rate, circulation pressure, and the characteristics of the mud: viscosity, gel strength, weight, etc., you can get maximum effect from high rotary speeds and high weight on bit.

For example, right now in many areas Magcobar is reducing costs by increasing drilling rates with the use of low solids oil emulsion muds. Such a program results in fewer rock bits, fewer round trips, and faster penetration.

You'll find the assistance of the Magcobar team, working and planning with you, will help to keep your rig drilling at maximum speed and efficiency. Plan now to make full use of Magcobar on your next well.

Magnet Cove Barium Corporation
Houston, Texas

Magcobar
Complete
DRILLING MUD SERVICE

57-104

The *Schlumberger* Wire Line Formation Tester...

Offers reliable testing with the same speed, safety, and economy as other wire line logging services.

Formation tests are obtained with this tool when hole conditions prevent the use of other testing methods.

Pin-point testing...

The tool is set exactly at the level to be tested by correlation with the S.P. curve. This, combined with the fact that only a limited vertical section is tested, allows selectivity never before possible . . . oil/water or gas/oil contacts can be easily defined.

In one operation...

It's practical—The tool is run on Schlumberger cable anytime during drilling and at any level in the hole. This means economical testing.

It's safe—Formation pressures are contained at all times by the full weight of the mud column.

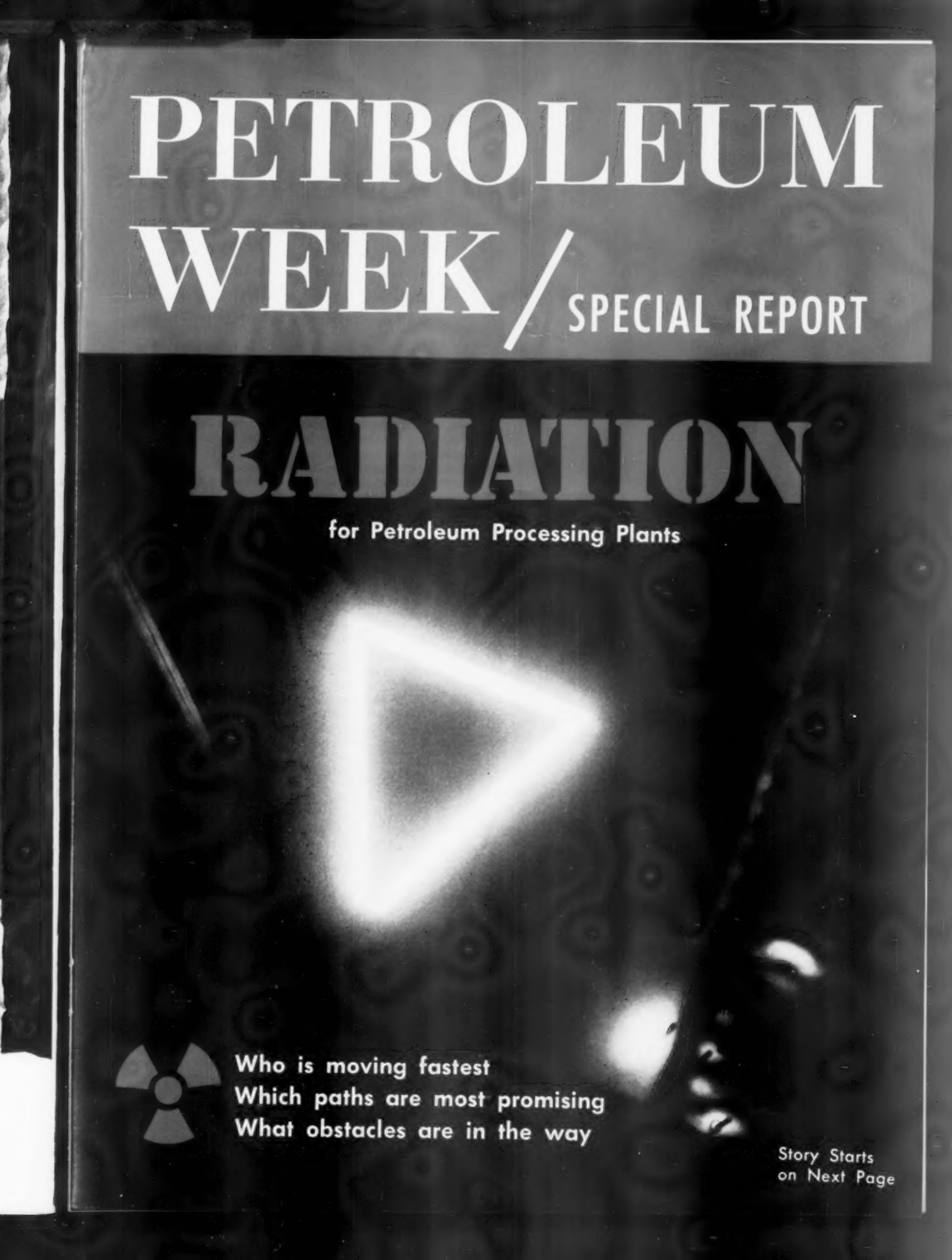
It's complete—A full set of formation pressures are recorded at the surface during testing operations. A five-gallon reservoir in the tester allows a sample to be recovered for fluid analysis.

SCHLUMBERGER... *Engineering for Better Service*

PETROLEUM WEEK / SPECIAL REPORT

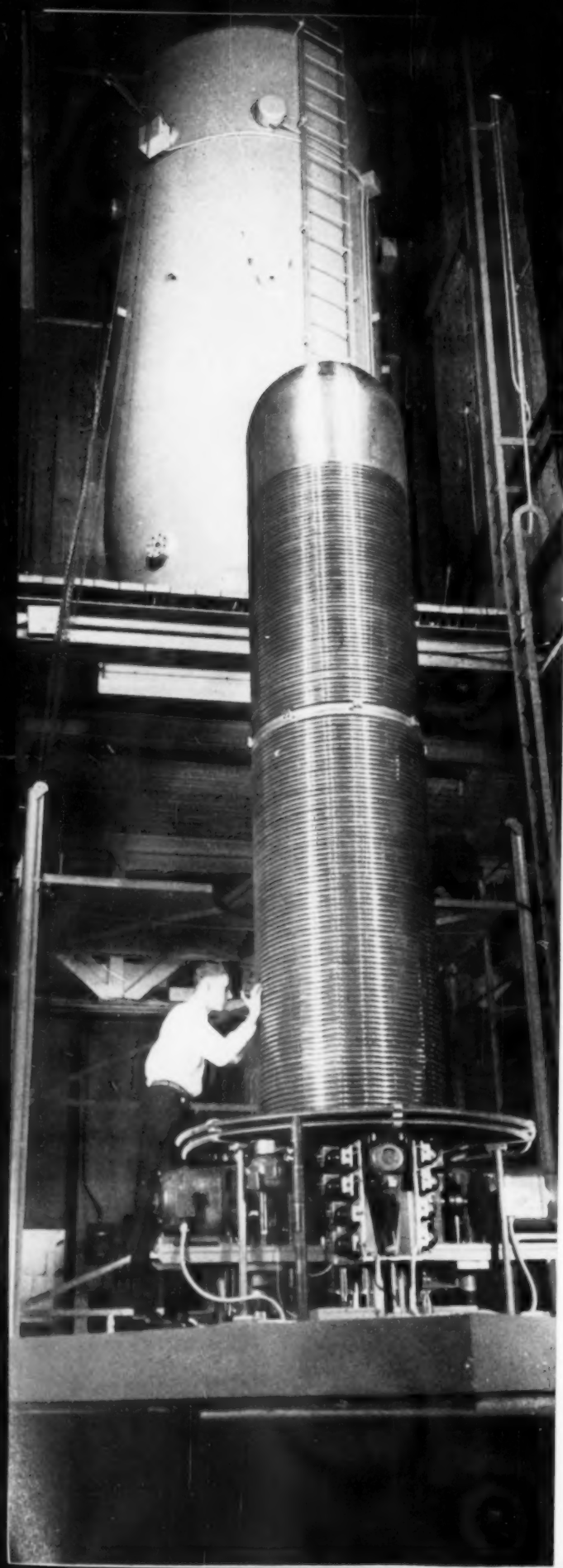
RADIATION

for Petroleum Processing Plants



Who is moving fastest
Which paths are most promising
What obstacles are in the way

Story Starts on Next Page



Radiation Warms

Fourteen big refiners are now saving millions of dollars a year by using nuclear energy as a tool to improve plant operations. But oil men have hardly begun to capitalize on the huge potential.

Nuclear energy is already starting to bring big returns to the petroleum processing industry. Last year alone, oil refiners saved $5-million to $10-million through the use of radioisotopes (radioactive forms of elements). This is the estimate of the U. S. Atomic Energy Commission. It includes the savings resulting from better controls, better maintenance, and new information at the plant and laboratory.

But the estimated high of $10-million is only a fraction of the possible savings in using radiation as a means of processing petroleum.

Radiation's value as a processing "catalyst" is now under intensive research by oil companies. For this reason radiation is often causing heavy expenditures, rather than bringing savings.

(When it comes to dollar savings, oil refiners have to take a back seat to oil producers. AEC estimates that the use of radioactive tracers in oil-well stimulation last year produced savings of $120-million to $140-million. This was by far the largest figure in the total savings by all U. S. businesses of $295-million to $485-million last year from use of radiation.)

These AEC figures were gathered by interviews and spot checks throughout American industry. There is a wide range in the estimates, because savings are tricky to measure. They are relatively easy to spot when a company abandons an expensive way of doing something for a cheaper way. But some research would not have been accomplished at all without radioisotopes. There is much value in the new information they have provided, and this is hard to price.

Excluded from the savings by refiners are those resulting from valuable studies of piston ring wear. Also not covered are savings through the use of radioisotope thickness gauges, radiographic testing, and corrosion studies.

As of now, 14 oil companies have large-scale radiation programs under way or planned. A Petroleum Week cross-section survey of refineries and petrochemical plants indicates that about 28% of the plants in the country are using radiation in some form. Another 6% are planning to use it.

Furthermore, all the radiation trend lines are rising sharply. The Atomic Energy Commission predicts that radioisotopes will be responsible for a saving of $500-million in all U. S. industry this year—and 10 times that figure by 1960.

A good share of the upward push should come from refiners. The continued interest in more automation, espe-

MACHINE RADIATION is coming from bigger and stronger equipment, such as this 6-mev. (million-electron-volt) Van de Graaff accelerator, made by High Voltage Engineering Corp.

Up to Bright Future in Processing

cially in optimizing operations, will make more and more refiners sit up and take notice of radioisotopes. Technical progress in the field, plus more information about radioisotopes at the management level, are leading to wider adoption of this offspring of the atomic age.

In this activity, the oil processing industry is keeping pace with other firms and institutions in the U. S. In 1946, only 83 licenses had been issued for use of radioisotopes, and only 280 shipments were made from facilities of the Atomic Energy Commission. This year, more than 4,100 licenses have been issued (1,700 of them to industry), and more than 30,000 shipments will be made.

Today, gauging is the most popular application of nuclear energy in the oil processing industry. Petroleum Week's survey shows that 74% of the refineries and petrochemical plants using nuclear energy have some form of commercial radioisotope gauge in operation. This count includes analysis gauges in control laboratories, level gauges, and thickness gauges—all using radioisotopes.

Use of these gauges should be even more widespread, particularly for special applications, as the price comes down. Until now, high cost has been the main objection to many commercially available radioisotope gauges.

The survey also shows that 58% of the active plants are using radioisotopes for nongauging applications.

The possible uses of radiation in the processing plant and laboratory are almost limitless. Typical applications of radioisotopes now being made are depth-gauging of liquids and solids, and detection of product interfaces in pipelines. A partial listing of other uses described in available literature includes: density measurements for fluid-catalyst distribution; flow measurements for mixing gases, liquids, and solids; entrainment in evaporators and distillation columns; mixing in alkylation units; determining flow rates in pipes; tracing the flow of fluid and granular catalysts; finding leaks in heat exchangers and underground pipes; measurement of tank volume; detecting the bypassing of bubble-tray downcomers; study of fluid-catalyst aging, loss, and attrition; and radiographic testing of metal parts, as well as of hot or cold welds.

Radioisotope level-gauges are in successful use on several refinery coker unit drums. They are being used to advantage on vessels under high or low temperature or pressure —where conventional gauges have difficulty.

Radioactive tracers have probably proved their worth more effectively in technical service work than anywhere else. The specialists in and outside the oil industry almost unanimously predict great profit from the use of tracers in studying both vessel efficiency and processes themselves. Such studies are of great significance to refiners, whose high capital investments and narrow profit margins place a big premium on getting the most out of the crude.

Work with tracers requires a minimum investment of only $2,000 to $4,000. Observers L. P. Elliott, vice-president of California Research Corp.: "Many companies have been slow to discover the powerful engineering tools that radiotracers offer for the study of processes. The details of such processes as distillation, entrainment, mixing, scrubbing, and settling can be studied in their quantitative aspects. This can be done not only in the laboratory

What radiation looks like . . .

. . . is shown by these radioactive bars of cobalt-60 under a protective 10 ft. of water in Cities Service research laboratory at Cranbury, N. J.

How the scientists define it . . .

. . . is shown by the list of terms below, a condensation of 101 definitions prepared by Esso Research & Engineering Co.

Accelerator A device for imparting very high velocity to charged particles.

Cobalt-60 A radioactive isotope of the element cobalt. It is used widely in oil company research.

Curie A measure of the rate at which a radioactive material throws off particles. The radioactivity of one gram of radium is a curie.

Gamma rays The most penetrating of all radiations. Gamma rays are very high-energy X-rays.

Geiger counter A gas-filled electrical device that detects the presence of radioactivity by counting the formation of ions.

Half-life A means of classifying the rate of decay of radioisotopes according to the time it takes them to lose half of their strength (intensity). Cobalt-60, for example, has a half-life of 5.3 years.

Mev Million electron volts.

Neutron An atomic particle having no electric charge. It makes an effective atomic projectile, since it is not slowed by the electrical attraction or repulsion of atoms.

Nuclear energy The energy released in a nuclear reaction, such as fission or fusion. It is popularly, though mistakenly, called atomic energy.

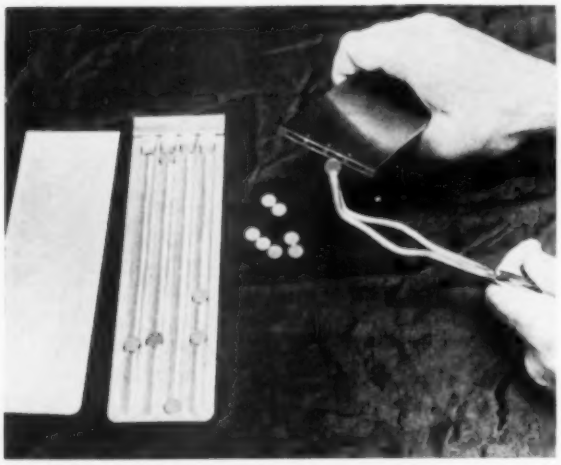
Radiation (radioactivity) The emission of very fast atomic particles or rays by nuclei. Some elements are naturally radioactive. Others become radioactive after bombardment with neutrons or other particles.

Radioisotope A radioactive isotope of an element.

Reactor An atomic furnace. In a reactor, nuclei of the atomic fuel undergo fission under the influence of neutrons. The fission produces new neutrons, and hence a chain reaction. This releases large amounts of energy, which is removed as heat.

Source Any substance that emits radiation.

Tracer A radioisotope mixed with a stable material, and used to trace the material as it undergoes chemical and physical changes.



COBALT-60 COINS totaling 15,000 curies in strength (samples shown in facsimile form) have recently been received by Esso Research & Engineering Co. Steel holders shield radiation.

and the pilot plant, but also in the full-scale plant, without interfering with its normal operations."

Some companies report they have saved large outlays for new types of equipment as a result of tracer studies showing that existing vessels worked just as well.

(Details of a dozen of the most widely-used applications of radioisotopes appear on page 121 to 126.)

Which Firms Are Doing What

Eleven big oil companies are now operating sizable radiation research facilities. For radiation sources, most of them are using either Van de Graaff accelerator machines that "manufacture" radioactivity, or the radioisotope, cobalt-60—or both. The 11 companies with a head start:

• Atlantic Refining Co. has a 1-mev. accelerator (General Electric's resonant transformer) attached to its research laboratory in Philadelphia. The company also operates a process loop (for experimental purposes) through the reactor at Brookhaven National Laboratory, Long Island, N. Y.

• California Research Corp.'s center at Richmond, Calif., is using both a large cobalt-60 source and a 2-mev. Van de Graaff for research work.

• Cities Service Research & Development Co. recently opened a new installation at Cranbury, N. J. The radiation source is 6,000 curies of cobalt-60, obtained from Brookhaven.

• Continental Oil Co.'s new $500,000 radiation laboratory at Ponca City, Okla., has received its first radiation source—powerful "spent" fuel elements from the Atomic Energy Commission's big nuclear reactor at Arco, Idaho.

• Esso Research & Engineering Co. has just added a 15,000-curie cobalt-60 source to the one installed in 1955 at the company's Linden (N. J.) research laboratory. The older source was originally 3,500 curies in strength, but has now decayed to about 2,500 curies. The new source is in the form of 300 coins, smaller in diameter, but thicker, than a dime (picture, left).

Esso Research also has a three-year contract with Battelle Memorial Institute, Columbus, Ohio, for work on the institute's research reactor. Total cost of the company's radiation research: $1-million a year (including $250,000 a year paid to Battelle).

• Gulf Oil Corp. operates a 3-mev. Van de Graaff accelerator at its new $3-million Mellon Laboratory at Harmarville, Pa.

• Humble Oil & Refining Co. is working with a 2-mev. Van de Graaff accelerator at its Baytown (Tex.) laboratory.

• Magnolia Petroleum Co.'s radiation research is mainly in oil exploration and production, rather than in processing research. At Dallas, the company operates 2-mev. and 0.5-mev. Van de Graaff accelerators, plus a small (15-curie) cobalt-60 source.

• Phillips Petroleum operates the National Reactor Testing Station at Arco for AEC through a special division. The company is keeping a tight lid on all of its own radiation activities.

• Shell Development Co. has a 3-mev. Van deGraaff accelerator in its radiation lab at Emeryville, Calif. The company also has a 2-mev. Van de Graaff for exploration and production research in Houston.

• Sinclair Research Laboratories' new radiation laboratory at Harvey, Ill., uses "spent" fuel elements from the Arco reactor as its source. Sinclair plans eventually to have fuel element sources equivalent in radiation power to 46,000 curies of cobalt-60.

Three other majors have important radiation facilities in the planning or building stage.

• Socony Mobil Oil Co. will shift its present small-scale radiation work to a lab now going up at Princeton, N. J. There the company will have a 2-mev. Van de Graaff accelerator, spent fuel elements, and possibly a cobalt-60 source. The fuel elements eventually will come from the research reactor Socony and nine nonoil companies plan to operate at nearby Plainsboro, N. J. This nuclear reactor is now under construction (picture page 106).

• Standard Oil Co. (Ind.) is reported to be considering purchase of an accelerator for its research laboratory at Whiting, Ind. The company has been doing its radiation research on a contract basis at the Argonne National Laboratory, and at the University of Michigan, Notre Dame University, and other institutions.

• The Texas Co. will build a special facility at its Beacon (N. Y.) laboratories. Three radiation sources will be installed: a 6-mev. linear accelerator, a 3-mev. Van de Graaff accelerator, and a 35,000-curie piece of cobalt-60. Texaco has been doing some radiation research at the Brookhaven National Laboratory.

Among the other majors, Sun Oil Co. reports that it has some research under way with radiation, but not enough to justify any capital expenditure as yet.

RADIATION SOURCES starts on p. 105

"... many companies have been slow to discover the powerful engineering tools that radiotracers offer for the study of processes ..."

When Specs Demand Job Matched Piping and Fittings One Call Will Do it All—B&W

The layout has been made. Erection schedules are in the planning stage. What you do now in contacting a source of supply for your alloy steel pipe fittings and flanges, can very well be one of your most important moves.

If you call on B&W, you can be assured of benefits that simplify scheduling problems. With one call to B&W—on one order—you can obtain matched pipe, fittings and flanges to meet your specific requirements. What's more—the delivery of the alloy steel pipe, the seamless welding fittings, and the forged steel flanges that make up the integrated system you desire—can be coordinated. This is just one more reason why B&W has earned the reputation and acceptance as "the natural source" for alloy pipe and fittings.

Call on Mr. Tubes at your nearby B&W Tubular Products Division District Sales Office—let him coordinate your alloy steel pipe, seamless welding fittings and forged steel flange problems. He can help you. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-7009-PP3

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steel.

avoid the hazards of carburetor icing with

GULF AGENT 178

...a better, less costly anti-stalling additive

Now you can stall-proof your modern volatile motor gasolines with a performance-proved additive at a lower cost than ever before.

FULLY PROVEN IN SERVICE—More than 25 billion miles of stall-free driving is proof of the effectiveness of Gulf Agent 178 in modern volatile motor gasolines.

INEXPENSIVE—Only 15 to 25 pounds of additive are required per thousand barrels of gasoline. No expensive storage space is required since you need so little of Gulf Agent 178.

EASY TO USE—Gulf Agent 178 is readily soluble in all petroleum products and can be blended easily at temperatures from minus 30° to plus 140° F. It is insoluble in water and can be used in conventional gasoline transfer systems with no danger of loss from water leaching.

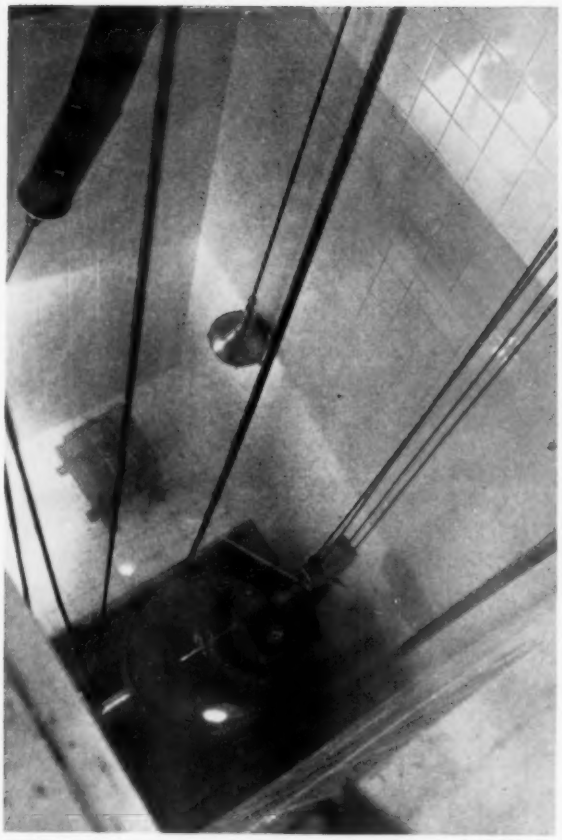
RUST PROTECTION—Gulf Agent 178 gives you an extra benefit by providing corrosion protection at no extra cost. Rust prevention lengthens the life of distribution and storage facilities all the way from refinery to customer.

Let us show you how Gulf Agent 178 can improve your gasoline!

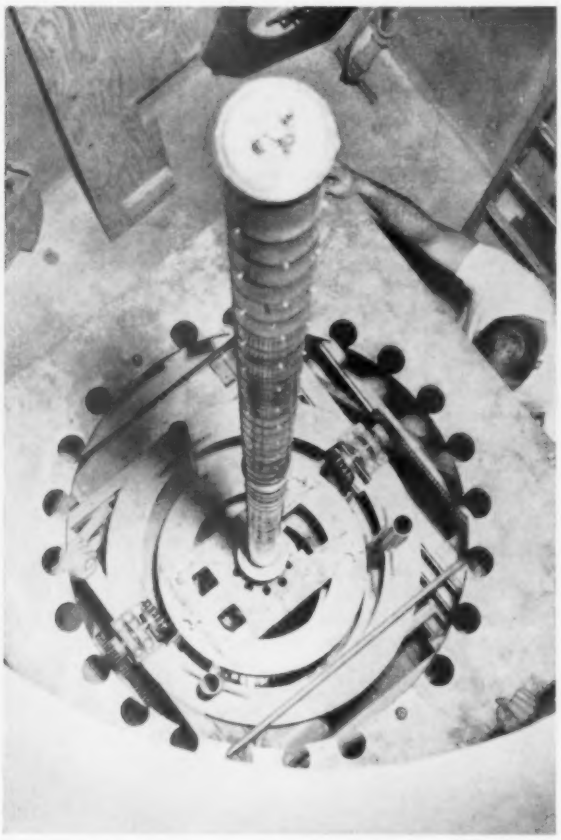
GULF

Petrochemicals Department
GULF OIL CORPORATION
Gulf Building, Pittsburgh 30, Pa.

QUALITY CHEMICALS
from
PETROLEUM



"SPENT" FUEL ELEMENTS from nuclear reactor are lowered to bottom of well containing 18 ft. of water (which provides shielding) in Sinclair's new research lab at Harvey, Ill.



ELECTRON BEAM GENERATOR (3½-mev. model made by General Electric) is example of equipment being made to supply "artificial" radiation. This is top view during machine test.

Radioisotopes vs. the Machines

Today, radioisotopes have an edge as the source of radiation at the oil plant —while accelerators lead in the lab. Tomorrow, the reactor should win new favor.

Oil companies in radiation work have a choice of "natural" or "machine-made" sources of radioactivity. In plant operations, in technical service work, and in the use of commercial gauges, radioisotopes are the source being used. (Some of these radioisotopes are artificial; they are made from a naturally stable element by changing the atom's structure. Others are unstable in their natural form.)

Only in the research end of the oil industry has there been controversy of the type heard in most other industries—between proponents of large radioisotope sources and of radiation-producing machines. At present the machines have a slight edge in the research lab.

Should the industry develop radiation-processing of oil on a practicable basis—one requiring large amounts of radiation energy supplied continuously—the controversy will be intensified.

Manufacturers of accelerators will naturally be in favor of the machine approach. Supporting the use of large radioisotope sources are the Atomic Energy Commission (main owner of reactors, in which radioisotopes are made) and others interested in building or operating private reactors.

Some oil companies have already installed both types of source—an expensive undertaking—in order to be able to try a variety of experiments and to gain experience with both.

Radioisotope sources are valued chiefly because of their penetrating power. Unlike machines, they require no maintenance.

Radioisotopes can provide gamma rays, a highly penetrating form of pure energy. These rays permit experiments with pressurized systems, since the gamma radiation goes right through pressure-vessel walls.

Because of this power, radioisotopes can cause chemical

reaction throughout a large volume of material. Most machine radiation, essentially, affects the surface layers of material.

Furthermore, the radioisotopes don't have to be touched by maintenance men until they "burn out," which may not be for years.

The accelerating machines have won a small edge in oil-company research because of their greater versatility and their smaller hazard factor. Some accelerators can provide neutrons, X-rays, and positive ions, as well as electrons. (Modifications to achieve this flexibility require time, however, and neutron output is at low efficiency. Some types of accelerators produce only electrons.)

Radiation from accelerators can be varied in voltage over a wide range. This permits a variety of test conditions. Radioisotopes, on the other hand, always emit a constant-voltage particle or ray.

Machines can produce a beam of radiation of great intensity in a small area, providing a lot of energy in one place. Gamma rays from radioisotopes (the most valuable emission) scatter their power. They cannot "dose" a single area as heavily.

Furthermore, accelerators provide high-voltage radiation. At 2 mev. and above, the particles have higher voltages than all but a few radioisotopes emissions.

Machine-produced radiation can be turned off and on, with no danger of lingering radiation. The need for shielding is not great. Radioisotopes are always "on," and must be constantly and heavily shielded.

In addition, machine radiation is cheaper than the large radioisotope sources. The oil companies feel that this is likely to be the case for many years.

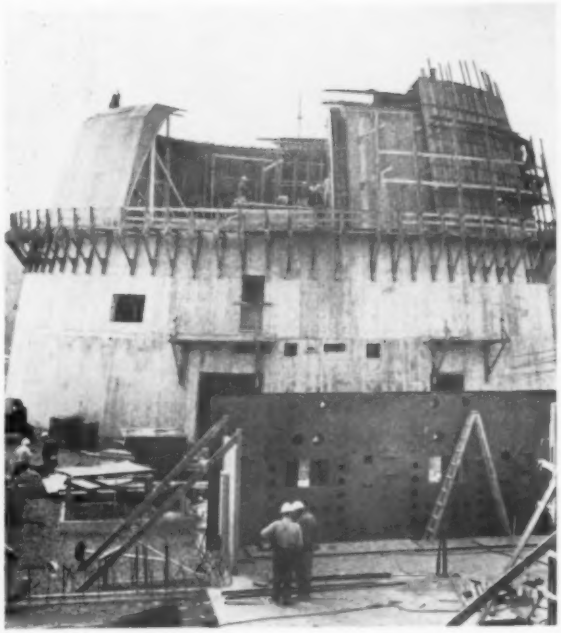
Often mentioned as a possible source for future radiation processing is the "spent" nuclear reactor fuel element, or fuel rod. Socony Mobil, Continental, and Sinclair have chosen this form of radioisotope source for research work.

The fuel elements will be plentiful in tomorrow's atomic power market. Since they become inefficient for reactor use when they are about 1% depleted, they will have to be replaced frequently. Although the fuel elements are called "spent" at this point, they are still generating a great deal of radioactivity from the "wastes" of the fission process (radioisotopes formed from the split atoms of uranium-235).

The energy output of these wastes is similar to that found in the reactor. The output covers a wide spectrum of energies, unlike a radioisotope such as cobalt-60, whose energy is all at one level.

The oil companies now using fuel elements in research are trying to duplicate, on a laboratory scale, a possible chemical-processing plant of the future. Some authorities feel, however, that these "spent" elements would not be economical as processing tools. There is the high cost of transportation from the reactor to the plant. There is the fact that many of the radioisotopes within the fuel element are short-lived. The fuel elements themselves may not be useful for more than four to six months, depending on several factors.

The result, according to several scientists, is that the fuel elements are unlikely to be used as processing sources, unless it is right at the reactor site or at a central fuel-processing plant.



NUCLEAR REACTOR being built at Plainsboro, N. J., by Socony Mobil and nine non-oil firms that are participating in Industrial Reactor Laboratories, Inc., for research work.

Oil companies have also been experimenting with the nuclear reactor itself as a radiation source for processing. They have circulated petroleum materials through loops of pipe running through the reactor, exposing materials to different types and intensities of radiation there.

The idea that reactors might be used for processing, as well as heat production, is not new. Large quantities of radiation—in addition to the heat—are released by the fission process. Some of this can be used for research, but processing is not yet feasible within the limitations of present reactor technology.

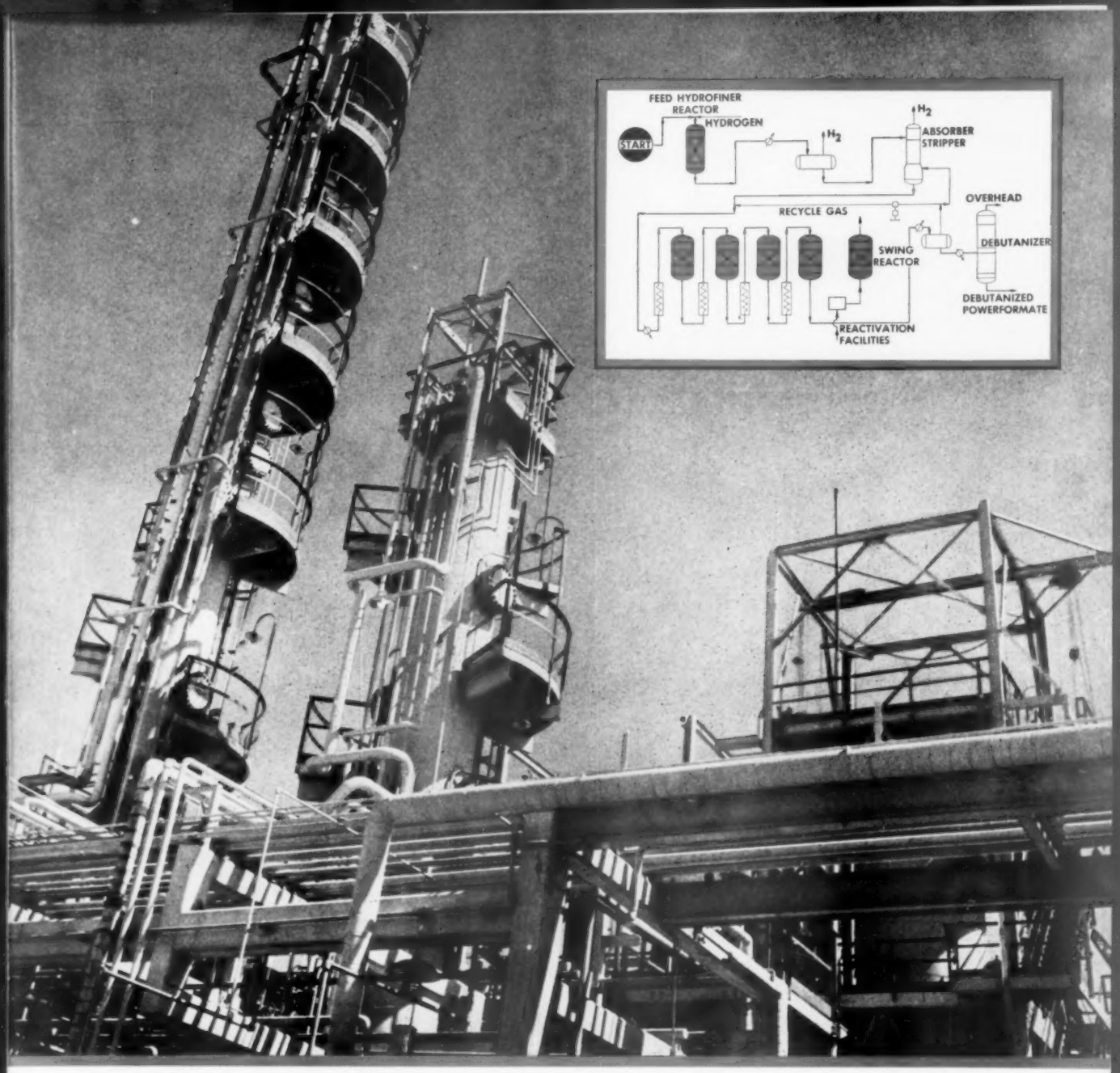
One of the main troubles is that the tremendous neutron radiation within a reactor can activate materials exposed to it. This is actually the basis for much of the useful research work being done. But in processing, a product might become radioactive—and thus unusable.

Some oil-company men in radiation research believe the day will come when this disadvantage will be overcome.

Already proposed is a way around the neutron-activation danger. Radioactive gases or fluids would be drawn out of the reactor, circulated through a separate chamber to irradiate a raw material, and then returned to the reactor.

The liquid or gaseous radioisotope would not emit neutrons because it would not be a fissioning material. This method would use part, although only a small one, of

". . . in only two years, our little laboratory group, starting with only a $2,000 investment, has become almost indispensable . . ."



POWERFORMING PROCESS CAN INCREASE YOUR HIGH OCTANE YIELD

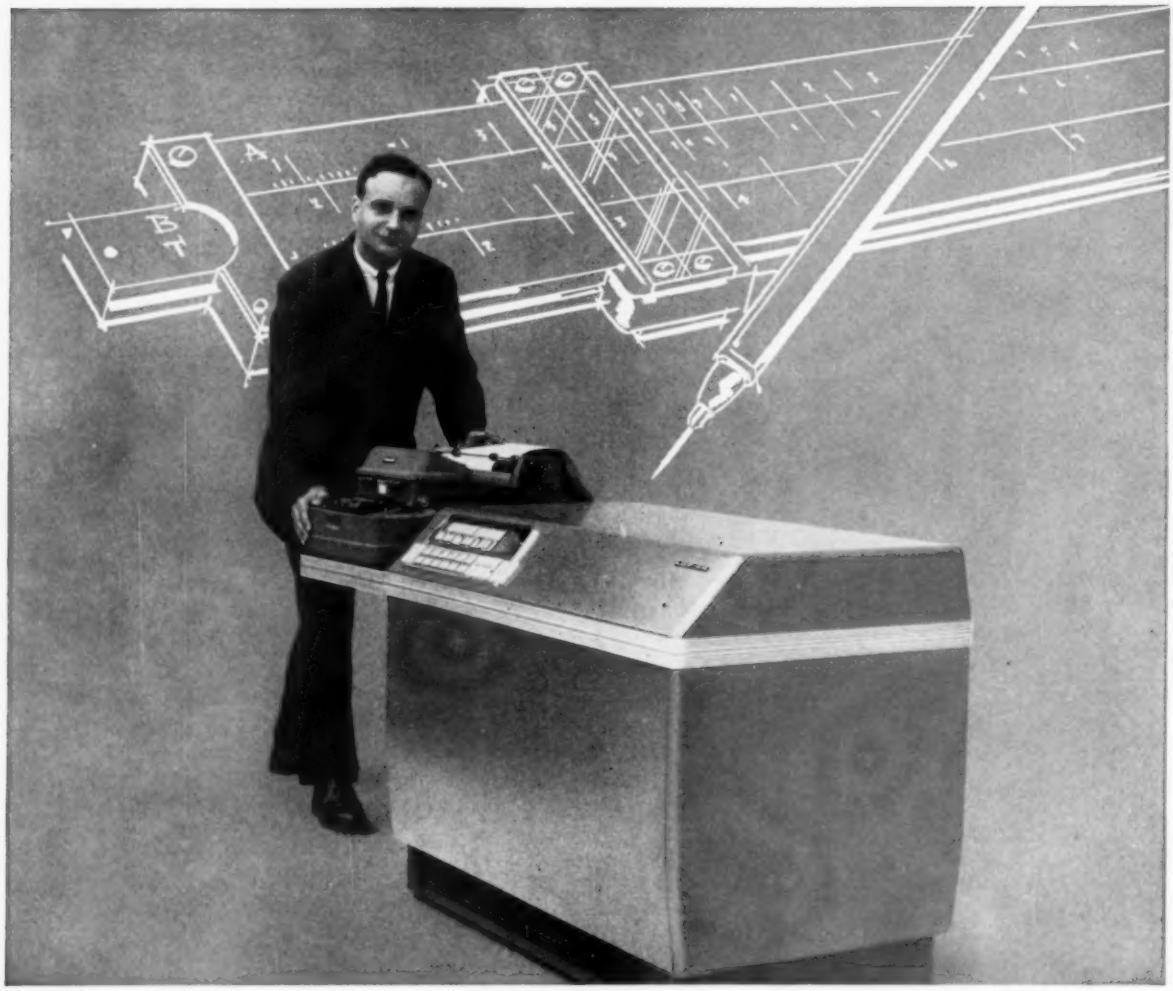
Esso Research and Engineering Company offers you *Powerforming*, the most versatile platinum reforming process ever developed. *Powerforming* is another achievement of the Esso Research program – 37 years of new process developments which have been made available to refiners around the world.

Heart of the *Powerforming* process is a new, more active platinum catalyst. High activity over a long life is assured by significant new regenerative techniques. With this new process, good yields of 100 octane clear Powerformate can even be obtained from paraffinic stocks. Three *Powerforming* installations are on stream; eighteen are in the planning or construction stage. Licensees enjoy benefits of continuing *Powerforming* research. We would welcome your inquiry on the part *Powerforming* can play in *your* modernization plans.

ESSO RESEARCH AND ENGINEERING COMPANY

15 West 51st St., New York 19, N. Y.

Your key to progress... an Esso Research process



Now! On-site linear programming at high speed with this powerful electronic computer

ROYAL PRECISION LGP-30

Here's the mobile, stored-program electronic computer with large capacity...direct print-out of answers

Compact, completely mobile . . . Royal Precision LGP-30 will today furnish you with high-speed electronic computation *wherever you want it* – give you more time for *creative* engineering. And at the lowest cost ever for a complete computer system!

Unusual capacity. Operating from any convenient wall outlet, the self-cooled LGP-30 allows you to work your linear programming *on site*. Used *right at your desk* for any other problem, LGP-30 gives you the greater flexibility of stored-program operation...speed, memory (4096 words) and capacity comparable to equipment many times its size and cost. (In one application, for instance, LGP-30 handled a linear program with as large a matrix as 46 x 27.) Answers are printed out directly in a format which requires no deciphering.

Simple to operate and program. LGP-30's controls are so simplified, even non-technical personnel are quickly trained. Programming is easily learned. A library of sub-routines, plus programs for a wide variety of applications, are available.

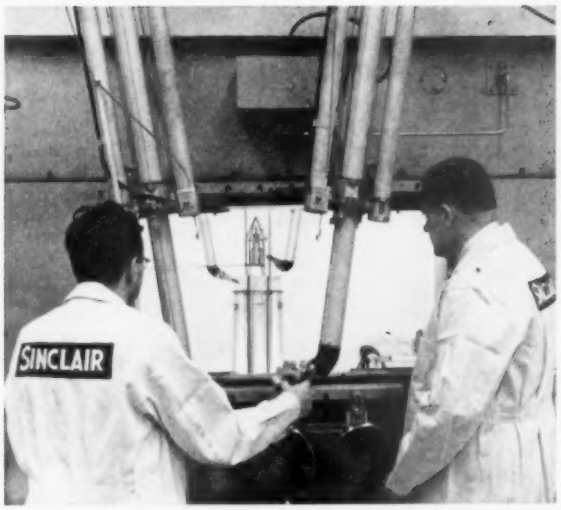
Wide scope of petroleum applications. Among the jobs for which LGP-30 is now being widely used in the petroleum industry are: pipeline problems, mass spectrometer problems, analysis of oil field production, flash point calculations, pumping and batching scheduling, correlation of seismic records, reservoir engineering studies and well-logging interpretations.

Exceptional value; complete service. Smallest initial investment ever for a complete computer is combined with low operating and maintenance costs. Service facilities are available coast-to-coast.

For further information and specifications, write Royal McBee Corporation, Data Processing Equipment Division, Port Chester, N. Y.

ROYAL McBEE

WORLD'S LARGEST MANUFACTURER OF TYPEWRITERS AND MAKER OF DATA PROCESSING EQUIPMENT



MECHANICAL HANDS are used to adjust "hot" fuel elements at Sinclair's research radiation laboratory at Harvey, Ill. Control wheels (below window) lower elements into place.

TRANSPORTATION CAUTION in radiation work is shown by shipment of cobalt-60 from Brookhaven National Laboratory, Long Island, N.Y., to Cities Service lab at Cranbury, N.J.

now-unused reactor radiation. Atomic power producers of the future may see in this system a way of sharing costs.

However, a choice of radiation source for processing can't be made now, since the oil industry does not yet know the conditions of a processing operation.

In fact, if a reaction of high efficiency were singled out for development into a process today, it probably would be impossible to obtain a radioisotope of sufficient size. If one could be found, the cost would be prohibitively high.

In addition, machines would have to be drastically improved for large-volume processing. Their penetration and the area covered by their beams are not great enough for a large flow of raw materials. This would be the case even if a pressure vessel were not a consideration.

When oil and petrochemical companies are ready to manufacture a product by radiation, there will be sharp competition between radioisotopes and machines for the industry's business.

Radioisotope work in the plant today is hampered to some extent by another problem: the need for more short-lived radioisotopes. Reactors or radioisotope-producing machines are too few—and too distant from most processing plants—to make the radioisotopes with short lives practicable on a wide scale.

The situation will be corrected partly by the growth of the atomic energy industry. "We can expect," explains G. W. Morgan, chief of the Atomic Energy Commission's isotopes extension, "that power reactors and radioisotope-production reactors will become as common as turbo-electric generating plants."

This picture, maybe 20 to 30 years from realization according to many estimates, can be filled in during the intervening years by the small, portable reactors being developed. These units, now priced between $55,000 and several times that figure, will become cheaper with further development.

George Manov, of AEC, thinks it may not be many years before a refinery might have a small reactor in the plant, simply to produce short-lived isotopes for process control.

L. P. Elliott, of California Research Corp., believes that, once the safety and cost problems are overcome, "these small reactors will be found indispensable in well-equipped petroleum research laboratories."

Several companies are enthusiastic about their results with small-scale use of radioisotopes.

Says C. C. Swoope, manager of Esso Standard's Baltimore refinery, "In only two years, our little laboratory group, starting with only a $2,000 investment, has become almost indispensable for solving refining problems."

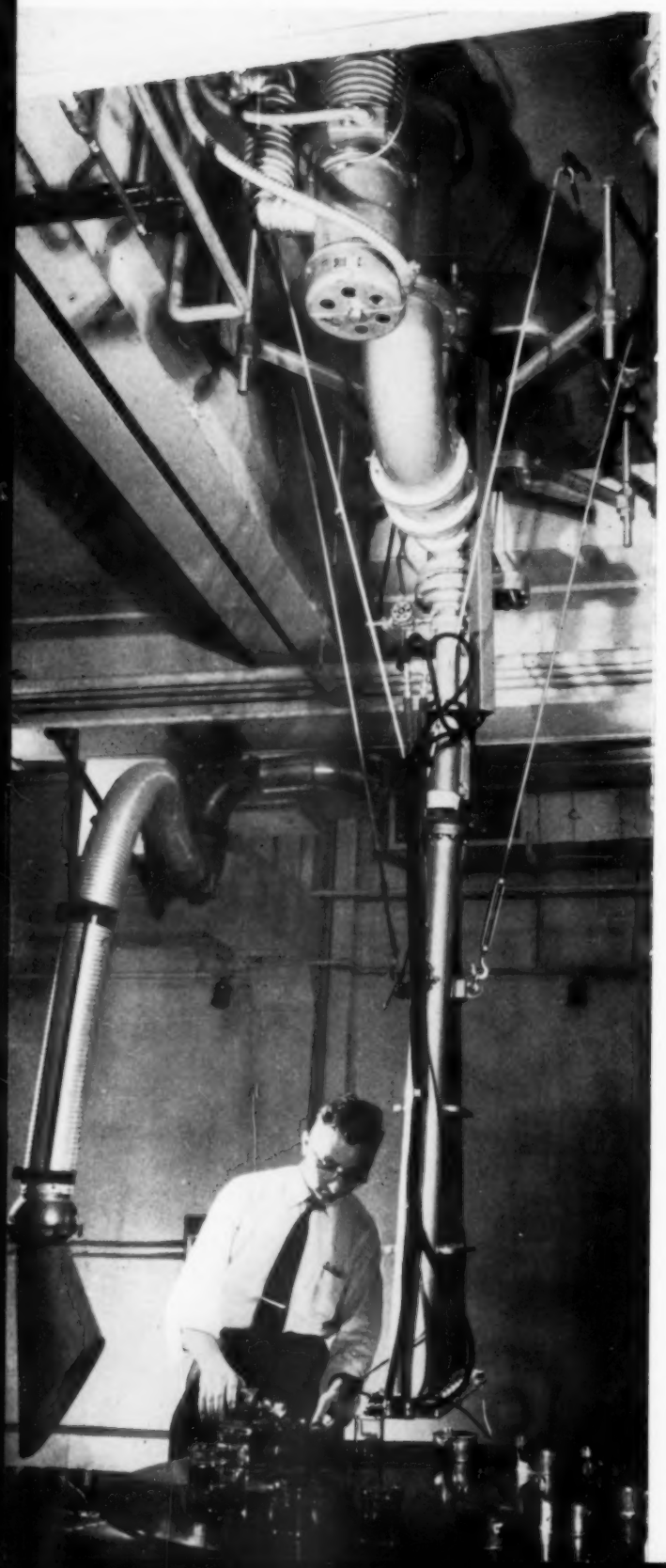
Plant maintenance work using sealed radioisotope sources starts at about $1,400. This will buy some small sources, detection instruments, and holders. It will provide a useful kit for such routine work as locating thin places, plugs, or bubbles in lines; checking aeration in fluid crackers; or verifying the performance of level gauges.

"Such applications," says Swoope, "may not have the glamor of some others. But they have a very rapid return and gain a lot of friends in a hurry."

The tools for these applications may be "home made" in the sense that the user may buy a radioisotope (already in a small capsule) and put it into a gauge of his own design. Or, if he wishes, the user may buy commercial devices with a radioisotope already included.

PROCESSING POTENTIAL starts on p. 110

". . . we can expect that power reactors and radioisotope production reactors will become as common as turboelectric generating plants . . ."



Big Target Is Processing By Radiation

The next 5 to 10 years will tell whether the cost barrier can be overcome. In the meantime, radiation should expand rapidly in process-control and maintenance.

Years ago, oil companies recognized where the really big payout in radiation lies. This is in the effect of radiation on petroleum—in processing itself. Today, most of the big oil companies are aiming research projects in this direction.

Their activity has picked up suddenly in the past three years. This has largely been the result of two factors: (1) serious moves by the government and private industry to build up the atomic power industry; and (2) competition among the oil companies to stay on top of the rapid growth of knowledge in the nuclear energy field.

The prospect of obtaining large amounts of radiation as a byproduct of nuclear power has always figured prominently in industry thinking about the future of radiation in petroleum processing. Radiation costs are still clearly out of line for most processing applications. But costs are expected to diminish greatly as the number of nuclear reactors, and the volume of their radioactive "wastes," continue to grow.

When will the first processing use of radiation come? A guess of from five to ten years is sometimes heard. An unconfirmed report even has one company planning to announce a radiation process before 1960. A lot of basic research lies ahead, and some firms will move cautiously in a field that does not appear to promise immediate profits.

Says one oil-company radiation scientist, "If we're not developing a process within five years, we'll probably be out of radiation work altogether."

Research in the past few years indicates that radiation can't be used profitably for some of the important refining processes, such as cracking and alkylation. Radiation often makes these processes "work"—that is, it causes the desired reaction. And sometimes this is done with better yields, or at a lower temperature. But for now, and perhaps permanently, the use of radiation in many of the main refining processes cannot be justified economically.

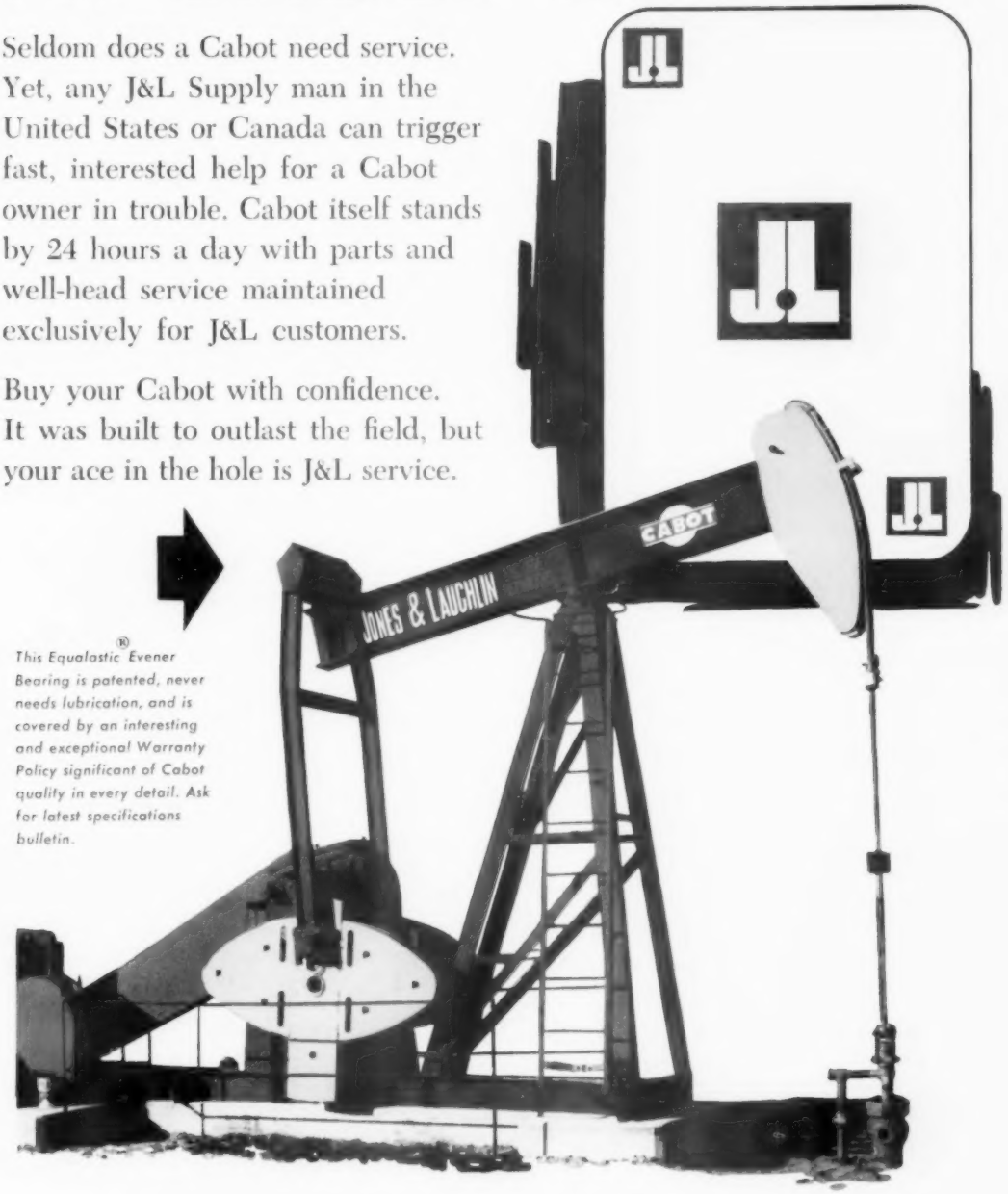
Petrochemicals and plastics look much more promising at the moment. There are many petrochemical products for which high unit prices make a relatively expensive

ATOM SMASHER at Gulf Oil's Harmarville (Pa.) research center is used partly in processing research. It can direct a 3-mev. beam on samples rotated on table.

ACE IN THE HOLE for CABOT owners

Seldom does a Cabot need service. Yet, any J&L Supply man in the United States or Canada can trigger fast, interested help for a Cabot owner in trouble. Cabot itself stands by 24 hours a day with parts and well-head service maintained exclusively for J&L customers.

Buy your Cabot with confidence. It was built to outlast the field, but your ace in the hole is J&L service.



This Equalastic® Evener Bearing is patented, never needs lubrication, and is covered by an interesting and exceptional Warranty Policy significant of Cabot quality in every detail. Ask for latest specifications bulletin.

Jones & Laughlin

SUPPLY DIVISION – Tulsa

J&L — A GREAT NAME IN SUPPLIES

Cooling with Air AND MINIMUM WATER IN A MODERN REFINERY

Process cooling in Cosden Petroleum Corporation's new West Texas refining units is largely by direct use of air. Over 250 million BTU's per hour are dissipated directly to five billion standard cubic feet per day of air moved by 38 fans in HUDSON Solo-aire or Combin-aire units.

Solo-aire units are used where low effluent temperatures are unnecessary. Combin-aire units, in which air is first precooled with water, are used where lower effluent stream temperatures are required. The cooled water from the Combin-aires is available for other cooling services; the Combin-aires in this case performing the further function of water cooling towers. Water spray, carryover or condensation is impossible as the effluent hot air is under saturated with water vapor. Combin-aires are installed adjacent to other process equipment.

These Solo-aires and Combin-aires at Cosden, and hundreds of other HUDSON units in oil, gas and chemical processing plants confirm the advantages of cooling with maximum air and minimum water.

Before finalizing design of new process units, let HUDSON assist you in determining optimum balance in use of air and water.

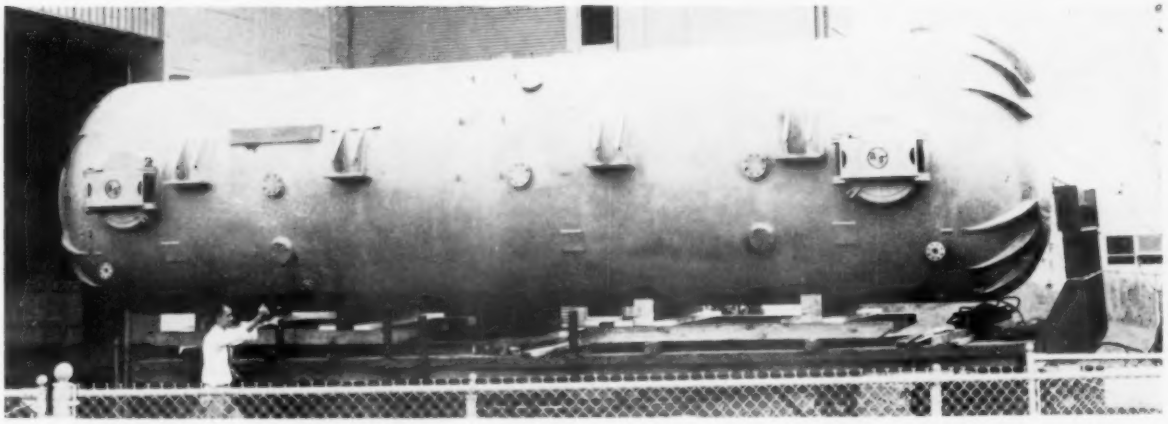
Air-cooled equipment bulletin mailed upon request

HUDSON

ENGINEERING CORPORATION

FAIRVIEW STATION • HOUSTON, TEXAS

OFFICES: 405 Lexington Ave., New York 17, New York • 2500 W. Sixth St., Los Angeles 57, California



PRESSURE TANK for world's largest Van de Graaff accelerator (10 mev.) shows how radiation machines keep growing.

step, such as that provided by irradiation, a feasible one.

Plastics, although outside the refiner's traditional domain, could become important if a profitable reaction that uses petroleum raw materials were to turn up in oil-company laboratories.

But radiation's greatest value for the industry, some scientists stress, is not its use for existing processes. The special properties of atomic radiation make it very likely to uncover new products and processes.

Radiation creates large amounts of reactive molecules in chemical systems, making possible a variety of reactions in many cases.

Radiation is absorbed by the system at both high and low temperatures, without difference in the amount of energy absorbed. This is the basis for using radiation as a substitute for part of the needed process heat.

Also, it has been suggested that molecules too heat-sensitive for conventional processing might be convertible in a "cold process" activated by radiation.

Radiation can work in solids. Certain polymerizations have been carried out experimentally with solids. For instance, scientists at Brookhaven National Laboratory have polymerized acrylamide, acrylic acid, and other chemicals in the solid state.

Radiation adds no impurities. The source can be entirely outside the reaction zone, so that only the energy is introduced into the reaction.

Understanding and classifying reactions from radiation have been the main research targets until now. Important to the development of processes are facts such as these:

Like heat, radiation adds energy to a molecule. If enough is added, the molecule becomes reactive, and may enter into new combinations. But radiation energy can compete in price with heat energy only where its special qualities permit improved conditions or special reactions.

All types of radiation supply energy. Alpha, beta, and neutron particles, as well as gamma and X-radiation—all will interact with atoms or molecules and give them energy.

Some kinds of reactions—the "chain reactions"—generate enough energy, once they are activated, to continue on their own. Only at the activation step must outside energy be supplied. An example of activation is the spark needed to ignite the gas-air mixture in an automobile combustion chamber.

In other reactions, energy is absorbed, not generated, and extra energy is needed from the outside to sustain the reaction. These are obviously not chain reactions.

But even among chain reactions, there are big differences in efficiency. Some will involve many, even thousands, of molecules in the reaction, energy being transferred from molecule to molecule. Others will stop transferring energy much sooner.

Oil company scientists now have a fairly clear picture of radiation-induced processing reactions, with the radiation efficiency of each measured in terms of "G-value" (the number of molecules reacting per 100 electron volts of radiation energy absorbed).

William A. Wilson, of Standard Oil Co. (Ind.), calls radiation efficiency "the key to commercial radiation processing." In a paper presented at the Second Nuclear Engineering Congress, in Philadelphia this year, Wilson breaks down radiation-induced reactions into three groups.

In the first group are high-efficiency reactions, with Gs of more than 100. This group includes chlorination of aromatics (G-10,000 to 1,000,000), oxidation of ethylene to acids and aldehydes (G-200) copolymerization of butadiene and styrene (G-500 to 1,000), or olefins and sulfur dioxide (G-1,000 to 10,000), and polymerization of ethylene (G-500 to 10,000), or styrene (G-200 to 800) to solids.

Polyethylene made by radiation is different in structure from the catalytic varieties. Recent studies show it might be competitive with high-pressure polyethylene. But it would be more expensive to make than the low-pressure Phillips or Ziegler types.

In the second group are reactions of moderate efficiency, with G's from 10 to 100. These include: polymerization of acetylene (G-75), butadiene (G-30), and propylene (G-20 to 30); and conversion of mer-

". . . if we're not developing a process within five years, we'll probably be out of radiation work altogether . . ."

captans in olefin streams, as sweetening (G-20 to 100).

Sweetening is the conversion of the odorous mercaptan sulfur found in petroleum streams to sulfides or disulfides. Only small amounts of mercaptans are usually present, so that complete conversion can be obtained with small radiation dosages.

However, Indiana Standard's Wilson points out: "The hydrocarbon type of the particular stream plays a large part in the efficiency of the reaction." When only 5% aromatics are added to paraffins, efficiency is cut by almost 50%. The opposite effect was shown with addition of 10% olefins. Then efficiency increased 15 to 20 times. Adding 10% olefin to an aromatics stream boosted efficiency 30 times. But when 10% aromatics was added to an olefin stream, efficiency decreased by about 25%.

Summing up, Wilson says, "This inhibiting or protective effect of aromatics is fairly general, and can be a limitation to the use of radiation in petroleum conversions, as most refinery streams contain aromatics."

In the third group are low-efficiency reactions—with G's under 10. These include such standard processes for making high-octane gasoline as cracking (G-1 to 2) and alkylation (G-3 to 10). Other inefficient reactions are sweetening in paraffins (G-3 to 5) or aromatics streams (G-1), and crosslinking of solid polyethylene (G-3 to 5).

Though crosslinking is inefficient, Wilson notes, "a relatively small amount of energy will cause complete conversion, i.e., an average of one crosslink per molecule." This may be the reason that radiation is already a production tool for crosslinking polyethylene coated wire and polyethylene tape in another industry.

"At today's radiation cost," Wilson concludes, "reactions with G-values greater than 1,000 would cost pennies per pound. This price can be borne by many chemical products. Without doubt, radiation will be first utilized commercially with such efficient processes.

"For less-efficient reactions, each case needs study. Such reactions as paraffin polymerization, alkylation, or cracking to form gasoline would have radiation costs of $1 a pound, and are definitely not attractive today. Olefin reactions to form gasoline have G-values approaching 100 and are about one order of magnitude from being attractive.

"In the future," Wilson concludes "these olefin reactions are almost certain to be attractive and paraffin reactions may be."

In addition to work on direct initiation of processing reactions by radiation, oil companies are shown to be researching actively the irradiation of catalyst to improve its activity.

By damaging the catalyst surface in subtle ways with radiation, it has been found that, in certain cases, short-lived improvement can be obtained. A recent success reported from England involved gamma-irradiated iron catalysts. For about 300 hours, conversions with the catalyst in the Fischer-Tropsch process (synthesis of hydrocarbons) were improved 10%-40%.

Catalysis is still a little-understood field. Some scientists believe that slight imperfections on the catalyst surface may enable it to transfer energy among molecules as it does. Irradiation, then, is an attempt to cause further

"HOT CAVE," shown at right of Sinclair lab at Harvey, Ill., has 55-in.-thick door of magnetite ore encased in steel. Door won't open unless fuel elements are at bottom of water well inside. Five-key system requires two men to open door.

atomic rearrangements on the surface of the particles.

Catalyst irradiation has economic appeal. Not only is it independent of radiation efficiency, but it offers a case in which treatment of a small volume of material serves indirectly to affect a much larger volume of raw material.

Also, oil researchers are well aware that the high cost of radiation could be overcome partly by combining radiation with one or more of the three process variables the industry uses today—heat, pressure, and catalysts. This could mean that radiation may be attractive as a supplementary tool in processing well before the industry develops an economic reaction that radiation can operate by itself.

If radiation could be used to supplement heat, it could produce lower processing temperatures, and fewer wasteful side reactions.

A petrochemical company executive speculates about this possibility by saying: "When you make acetylene, for instance, you need such high temperatures that the dissociation caused by heat lowers yields. If you could operate at lower temperatures and put in the remaining energy with radiation, yields might show a big improvement."

Lower temperatures would also mean less corrosion, and less insulation needed for equipment.

Or radiation might substitute for catalyst, but in the presence of heat and pressure. Process economics might be improved if the problems of catalyst regeneration and reduced activity were done away with. Also, such an arrangement would rid the reaction vessel of a source of contamination. This might be particularly advantageous in a polymerization process, where yields are seriously affected by small amounts of contaminants.

Process-Control Is Likely

Although radiation in processing has some big question marks, radiation in process control is a different matter. It is widely expected that sealed, fixed gauges and tracers will be linked to control apparatus, and even computers, to regulate some process steps.

Says V. P. Guinn, of Shell Development Co., "It would

". . . it would be possible to measure several isotopes simultaneously by feeding the output of a multichannel analyzer directly to a computer . . ."

This announcement is neither an offer to sell nor a solicitation of an offer to buy any of these Shares. The offer is made only by the Prospectus.

6,549,124 Shares

Standard Oil Company

(Incorporated in New Jersey)

Capital Stock

($7 Par Value)

Rights, evidenced by subscription warrants, to subscribe for these shares are being issued by the Company to the holders of its Capital Stock, which rights will expire at 3:30 P.M. Eastern Standard Time on December 18, 1957.

Subscription Price $44 a Share

The several underwriters may offer shares of Capital Stock at prices not less than the Subscription Price set forth above (less, in the case of sales to dealers, the concession allowed to dealers) and not more than either the last sale or current offering price on the New York Stock Exchange, whichever is greater, plus an amount equal to the applicable New York Stock Exchange commission.

Copies of the Prospectus may be obtained from only such of the undersigned as may legally offer these Shares in compliance with the securities laws of the respective States.

MORGAN STANLEY & CO.

KUHN, LOEB & CO. — ***THE FIRST BOSTON CORPORATION***

BLYTH & CO., INC. — ***EASTMAN DILLON, UNION SECURITIES & CO.***

GLORE, FORGAN & CO. — ***GOLDMAN, SACHS & CO.*** — ***HARRIMAN RIPLEY & CO.*** Incorporated

KIDDER, PEABODY & CO. — ***LAZARD FRERES & CO.*** — ***LEHMAN BROTHERS***

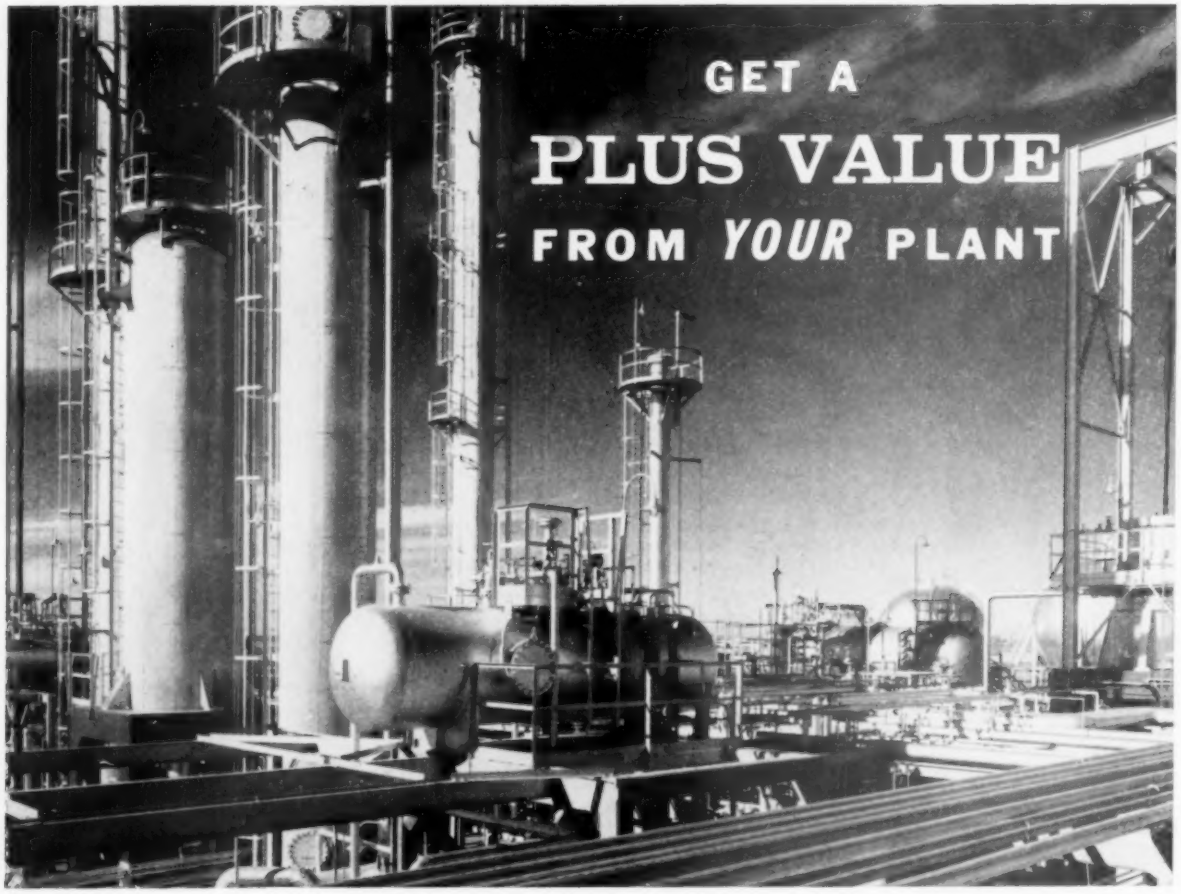
MERRILL LYNCH, PIERCE, FENNER & BEANE — ***SMITH, BARNEY & CO.***

STONE & WEBSTER SECURITIES CORPORATION — ***WHITE, WELD & CO.***

DEAN WITTER & CO. — ***DREXEL & CO.*** — ***HORNBLOWER & WEEKS***

F. S. MOSELEY & CO. — ***PAINE, WEBBER, JACKSON & CURTIS*** — ***WERTHEIM & CO.***

November 12, 1957.



You always get a *plus value* in engineering ability and construction skill when your plant is planned and built by The REFINERY ENGINEERING Company. TRECO has never been guided by *minimum* requirements on any job, large or small.

Remember the *plus value* TRECO offers when you plan your next plant.

1942 TRECO 1957
15th ANNIVERSARY

A brochure showing work done by TRECO is available. A copy will be mailed you promptly upon request on your company's letterhead.

A DIVISION of VITRO CORPORATION of AMERICA

The REFINERY ENGINEERING Company

NEW YORK TULSA TORONTO

be possible to measure several isotopes simultaneously and rapidly by feeding the output of a multichannel analyzer directly to a computer. The computer, in turn, could use the information to control several parameters of a process." Guinn sees an extensive coupling of automation and radiation coming in the future.

Telefluorscopy—a fluoroscope picture sent over a television circuit—is a future process-control idea that's intriguing refiners. With it, an operator could sit in the control room and watch closely the catalyst flow pattern at some point in the cat cracker standpipe. Or he could watch the fluid flow through a critical distillation tray. Instead of an X-ray generator, gamma rays from a radioisotope would supply the radiation.

Telefluoroscopy has been tried experimentally in a refinery, but two important defects exist. First, for refinery-size equipment, prohibitively large sources (200 curies and up) are needed. Reason is the sensitivity limits of present-day fluoroscope screens. The danger to personnel and the cost of such sources are obvious. Increasing the sensitivity of the fluoroscope unit may be a partial answer, and manufacturers are working on it.

The second drawback is that reflected, scattered radiation—an inevitable feature of a radioisotope—tends to spoil picture definition. This may be the toughest obstacle to overcome.

Process control will also be advanced by refinement of detection instruments and by greater availability of short-lived radioisotopes. Improved instruments will permit use of smaller quantities of tracer, thus reducing the problem of product contamination.

With more short-lived sources available, it will be possible in many cases to use radioisotopes whose activity virtually vanishes by the time the product is ready to leave the refinery. Among such sources are sodium-24 (half-life, 15 hours), potassium-42 (12.5 hours), and gallium-72 (14.1 hours).

New Uses in Maintenance

In the refiner's maintenance armory, there may well be a useful place for isotope radiography. With it, he would be able to spot tray displacement, or metals clogging bubble caps, without taking the unit off stream. One refinery experimented with radiography on vessels during operation and reported excellent results. A 10-curie source obtained sharp film definition across 12½-ft. bubble tower after several hours of exposure. But this was exceptional, according to the technicians.

In general, isotope radiography has not become popular, because of poor contrast in the picture compared with radiographs obtained with an X-ray source. In special cases, however, it is very valuable, and wider use is expected as better techniques are developed.

As in process control, maintenance work with tracers will be boosted by greater availability of short-lived radioisotopes. In the future, says Jerry Kohl, of Tracerlab's western division, short-lived sources will be in general use for finding "flow rate and distribution in fractionating towers and cooling towers, and for determining the condition of mixers and baffles."

DECONTAMINATION service is provided by "flying squad" of Tracerlab, Inc., specialists. They remove dangerous, radioactive materials from laboratories after accidental spillage.

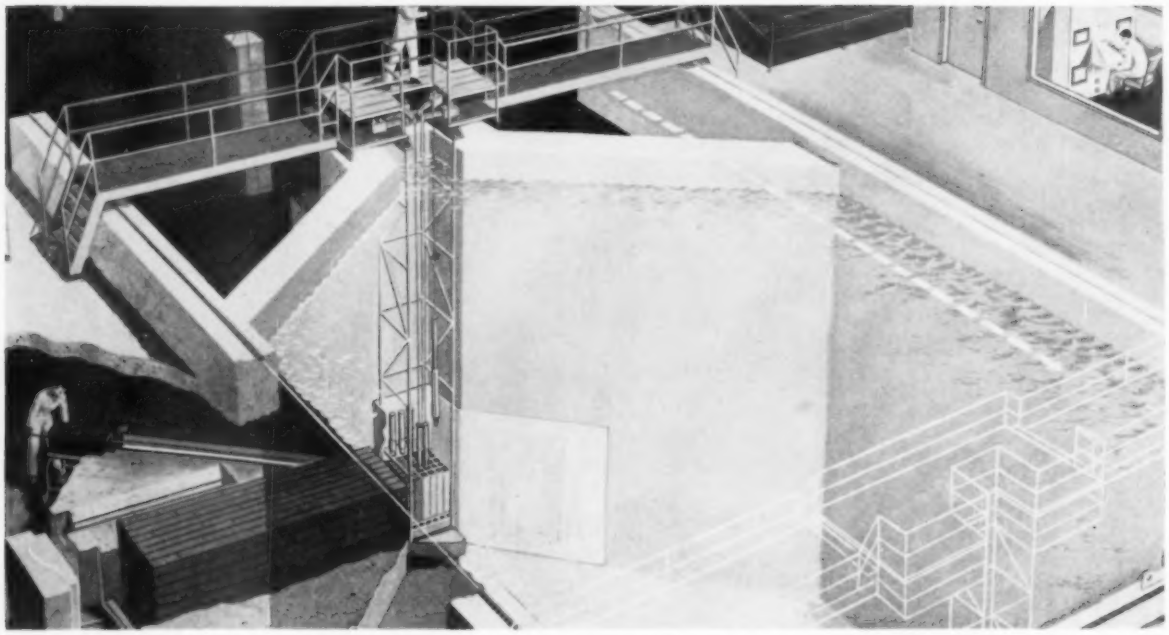
Kohl adds that such sources will also make practicable the routine use of tracers for "locating leaking valves and heat exchangers, and checking the performance of packing glands, pumps, and valves."

The possibility of lingering contamination holds back some applications today. The job of finding leaks in lines, often buried six to eight feet underground, would be easier if the refinery radiation team didn't have to worry that the radioisotope would contaminate the area for days, preventing repair work. If argon-41, for example, were available from a nearby source, the radiation men wouldn't have this worry. Argon-41 (a gas radioisotope with a 109-minute half-life) could be forced under pressure through the evacuated pipeline and then detected as it rose through the soil after passing through the break. Perhaps 5 to 10 half-lives later (9 to 18 hours), depending on the quantity used, the area would be open for repairs.

For some situations today, a short-lived radioisotope can be "created" on the spot by using a "milker." This device exploits the natural decay of certain radioisotopes into other, short-lived "daughter" radioisotopes. With a milker, the refiner can draw off freshly formed daughter product when needed, giving use of its full half-life.

An advantageous "parent-daughter" relationship exists in few radioisotopes, and only three milkers have been developed so far. At Esso Standard's Baltimore refinery, a milker using 77-hour tellurium and its 2.3-hour iodine daughter has come in handy for measuring the mixing efficiency of grease kettles, and for other applications. This

". . . with telefluorscopy, an operator could sit in the control room and watch the catalyst flow pattern in the cat cracker standpipe . . ."



POOL-TYPE REACTOR, being built at Plainsboro, N.J., for Socony Mobil and nine firms outside the oil industry by American Machine & Foundry Co., uses water to help shield radioactive core at bottom of pool. Experimental samples will be exposed to radiation by suspension from movable bridge, or by exposure through beam tube and bulk irradiation passage at left.

milker, which is easy to operate, comes from Brookhaven National Laboratory.

The third milker, developed by Oak Ridge National Laboratory, uses 12.8-day barium and 40.2-hour lanthanum.

Tracerlab sells a milker combining 33-year cesium and 2.3-minute barium. While the parent's half-life is ideal, the daughter is considered too short for many applications.

Activation Analysis Possible

A tool of great potential value in routine refinery operations is activation analysis, using radiation. It would allow the refiner to detect metal contaminants in feedstocks for catalytic processes.

This is significant, because the presence of certain metals is known to cause serious loss of catalyst activity by forming deposits on the atoms of the catalyst. Arsenic "plates out" on platinum catalyst, gradually destroying its activity. But with the activation technique, arsenic, along with vanadium and other metals, can be detected and measured at sensitivities higher than one part per million. The technique works in this way:

A sample of the feedstock is put inside a reactor, or exposed to radiation from an accelerator converted to produce neutrons. The neutrons "activate" the atoms of metal and other impurities in the sample. The radiation emitted by these activated atoms has a half-life and energy level characteristic of the element. In some cases, the element of interest can be measured by radiation analysis alone. In others, the sample must go through chemical separation before the radiation can be analyzed, a much longer procedure.

A related technique with probably somewhat less value might be called "reactor analysis." With this method, the nuclear reactor's behavior is studied when a sample material is inside. It will react sensitively to the neutron-absorbing, neutron-reflecting, or neutron-moderating properties of the sample. This technique is still in its infancy, and is best suited to small, portable-type reactors.

Activation analysis is limited to research at present, because it requires a neutron source of fairly high intensity—and the necessary accelerators and reactors are usually remote from refineries. For example, one company using the technique in research work in the Philadelphia area must allow a full week from the time the sample is sent to the reactor until final analysis (which usually requires chemical separation). Main reason for the time lag: The nearest reactor is at the Brookhaven National Laboratory, on Long Island, N.Y.

With such a time-lapse, the on-line use of activation analysis is clearly impossible. Needed is a plant-based source of neutrons, or a nearby reactor. It has been suggested that a private firm might set up a centralized activation-analysis service in the future. Using helicopter transportation from a small reactor or an accelerator, the firm might be able to serve refineries within a 50-mile radius.

EVERYDAY USE starts on p. 121

". . . it has been suggested that a private firm set up a centralized activation analysis service, using helicopter transportation . . ."

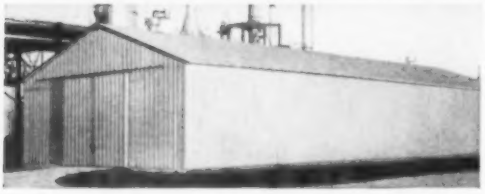
Roebling Royal Blue Wire Rope goes to any length to prove its **high strength!**

Every inch of every foot of Royal Blue is stronger than any rope you've ever used on *any* job. This on-the-job tenacity helps to make it the most widely and readily accepted rope in Roebling's history. It is but one of Royal Blue qualities that makes for its long service life—on any job you choose. For full details on Roebling Royal Blue Wire Rope talk to your distributor or write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for your copy of "*Wire Rope Recommendations and Catalog.*"

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Famous fire-fighter gets luxury offices, workshop at moderate cost with BUTLER buildings



Plain or Fancy — Butler buildings are used throughout the oil industry for offices, warehouses, compressor houses, tool and machinery sheds, garages.

This attractive Butler building is the base of operations for one of the world's best known oil well fire-fighters . . . Myron M. Kinley. He's the man who has fought and conquered raging infernos in almost every oil field in the world.

Such a distinctive business deserves a distinctive home – and Mr. Kinley got it at a moderate cost by combining an architecturally designed front and a Butler metal building. "We used a Butler pre-engineered steel framework and covered the sides and roof with Butler metal panels," explained Mr. Kinley. "This saved plenty because erection was so fast and simple."

"We like our Butler building fine," said Mr. Kinley. "It does a good job of housing our offices and workshop for making special oil field tools. Both areas are completely air conditioned. And, of course," he added with a grin, "because it's mostly Butler metal construction, it's fire-safe."

Butler buildings can help you save money, too. See your nearby Butler Builder for details. He's listed under "Buildings" or "Steel Buildings" in the Yellow Pages. Or write us.

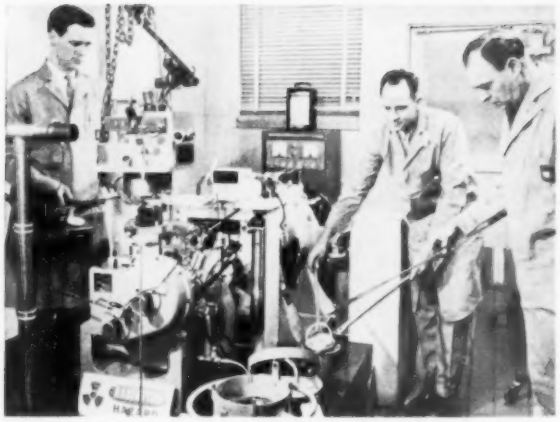
BUTLER STEEL PRODUCTS

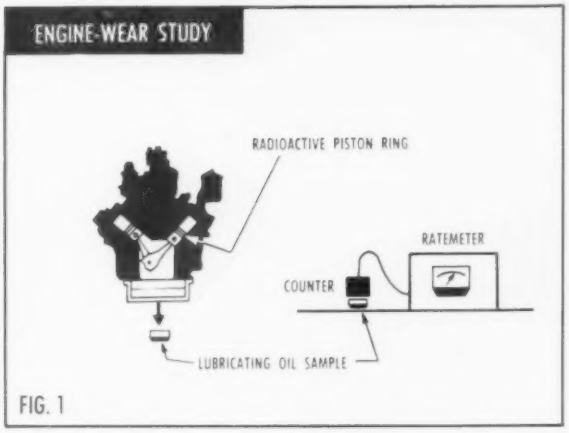
BUTLER MANUFACTURING COMPANY

7412 East 13th Street, Kansas City 26, Missouri

Manufacturers of Buildings • Oil Equipment • Farm Equipment • Dry Cleaners Equipment • Outdoor Advertising Equipment • Custom Fabrication

Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Atlanta, Ga. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. Detroit, Mich. • Cleveland, Ohio • Pittsburgh, Pa. • New York City and Syracuse, N. Y. • Boston, Mass. • Washington, D. C. • Burlington, Ont., Canada





RADIOACTIVE PISTON RING is removed from laboratory engine by Gulf scientists (left) as part of engine-wear studies (right).

Radioisotopes Becoming 'Workhorses'

Scores of applications in tracing and gauging have now been proved feasible. They are in everyday use at the refinery, petrochemical plant, and laboratory.

Many uses of radioisotopes that have proved their worth at the processing plant and laboratory are now considered "basic" applications. One of the oldest uses is tracing the wear of piston rings in engines (Fig. 1).

Experiments were made in the years before World War II to study engine wear as a function of the type of lubricating oil used. Phosphorus-32, produced in cyclotrons, was added to the metal mix making up the piston ring.

Today, the entire piston ring is made radioactive by subjecting it to neutron bombardment in nuclear reactors. The bombardment converts about one atom of iron out of a billion from stable iron-58 into radioactive iron-59.

Radioactive iron atoms wear off the piston ring, along with the others. They then enter the lubricating oil, where they are easily detected. Only a few minutes' running time is needed in the engine to detect piston ring wear.

The transfer of metal during engine wear can be measured to 0.00001 oz. (one one-hundred-thousandth) by the radioactive-piston method. One company said that this technique did work over a period of four years, and at a cost of $35,000. By older methods, it would have required 60 years and $1-million.

More recent developments have adapted this procedure to study the wear on other moving engine parts, such as gears, bearings, and cam followers.

Measurement of the hydrogen-to-carbon ratio in hydrocarbon samples is being made with radioisotope gauges, which may now be purchased from instrument suppliers (Fig. 2). The principle is this: When one constituent of a mixture has greater mass than another, absorption of radiation by the mixture changes as the proportion of the two constituents changes. The more radiation penetrating the fluid, the faster the "count" at the detector.

In the variation used to measure hydrogen-to-carbon samples, beta-radiation (composed of electrons) is used. The difference in beta-ray absorption, caused by variations in electron density in the sample, measures the hydrogen-to-carbon ratio.

Absorption, the principle behind a whole family of radioisotope applications, could also be related to other fluid properties—such as viscosity. Commercial exploitation of these relationships can be expected to follow longer experience.

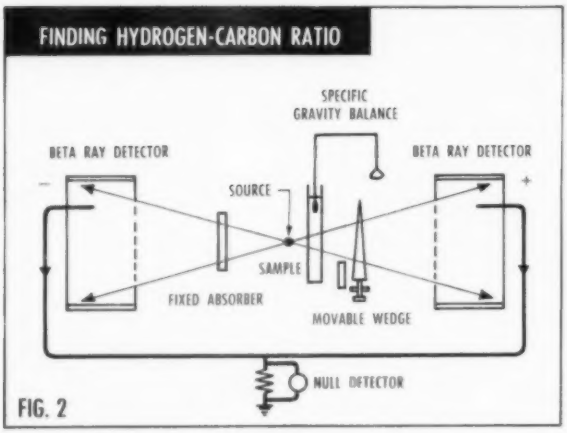
The absorption-type gauge (often called a density gauge because absorption is a function of density) has already been adopted for quality control in many industries. These gauges normally use a fixed cobalt-60 radiation source. They operate on the principle of gamma-ray absorption by the material or fluid stream being checked or controlled. In cigarette manufacturing, the amount of tobacco in each cigarette is regulated with a beta-ray gauge. In at least one cement plant, the percent of solids in an asbestos cement-water slurry line is controlled by an absorption gauge. In these applications, the gauge controls a compensating mechanism that adjusts the mixture.

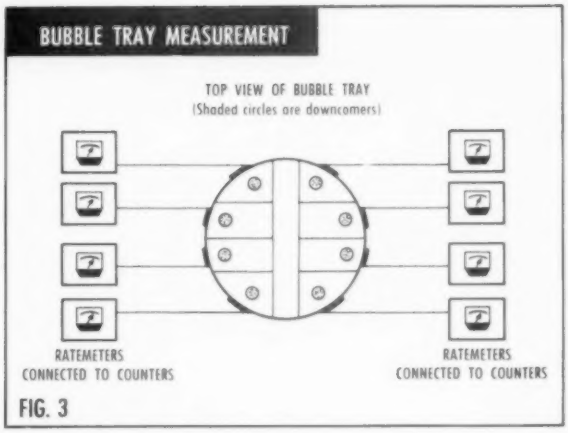
There are already several oil industry installations in which the composition of slurry from a process vessel is measured and controlled with such equipment.

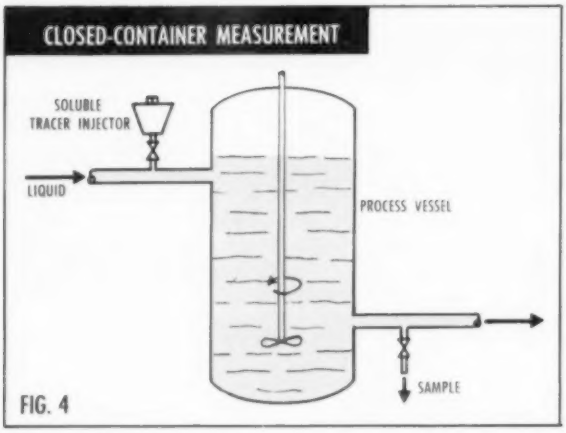
Faulty operation of distillation-column bubble trays is being pinpointed by using soluble radioisotope tracers and radiation detectors (Fig. 3).

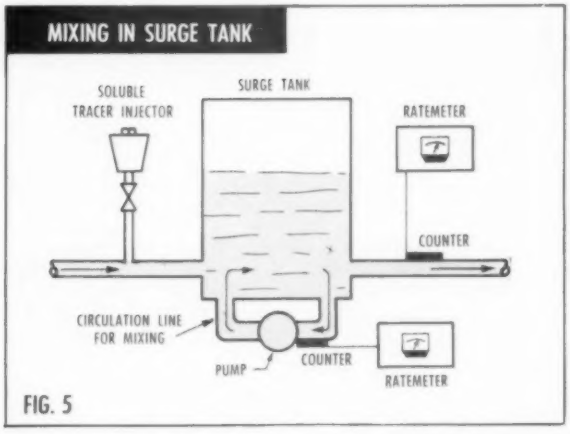
Example: In the case of one large vacuum distillation column, poor color in the overhead stream and the presence of heavy metals suggested that some of the bubble-caps in the trays were not properly flooded. Hence, unwashed vapor carried entrained liquid up through the tower.

Each bubble tray was divided by eight baffles. Radiation detectors were placed around the column, adjacent to each channel of a tray. Radioactive triphenylstibine was injected into the column. The radiation count for each detector was checked. As long as the detectors showed a consistent count between them, the tray being checked was operating satisfactorily. The detectors were then moved up to the next tray.









It was found that the four counters on one side of the column showed strong response as the radioactive tracer flowed down the downcomers of the bubble-caps. The four counters on the opposite side of the column showed little response.

The conclusion was that the latter counters showed that the downcomers were running dry (not flooded with liquid) and letting unscrubbed vapor pass through them and out of the column in the overhead product. A check of the column internals showed this conclusion to be correct.

The volume of liquid in a closed-process vessel can now be measured by the dilution of a known amount of radioactive tracer (Fig. 4). Foaming or a turbulent surface often makes actual liquid volumes hard to find by conventional instruments.

The so-called "exponential method" is used to find liquid volume in vessels through which there is a known constant liquid flow-rate. Soluble radioactive tracer is "batched" into the incoming liquid.

Assuming complete mixing in the vessel, the tracer concentration decreases exponentially with the throughput rate and the volume. From the tracer radiation count on a liquid sample, the volume of liquid in the vessel may be calculated.

A similar problem, solved by radioactive tracers, is finding the volume of sulfuric acid in an alkylation plant, where mixing of the acid and hydrocarbons in the process vessel prevents a sharp liquid level from forming. The volume is found by adding a known amount of radioactive cesium-134 to the sulfuric acid.

The tracer is mixed in, and a sample drawn out. The dilution of the radioactive isotope allows a calculation to find the total amount of acid in the vessel.

Radioactive isotopes can be used to check mixing completeness in stock blending operations (Fig. 5).

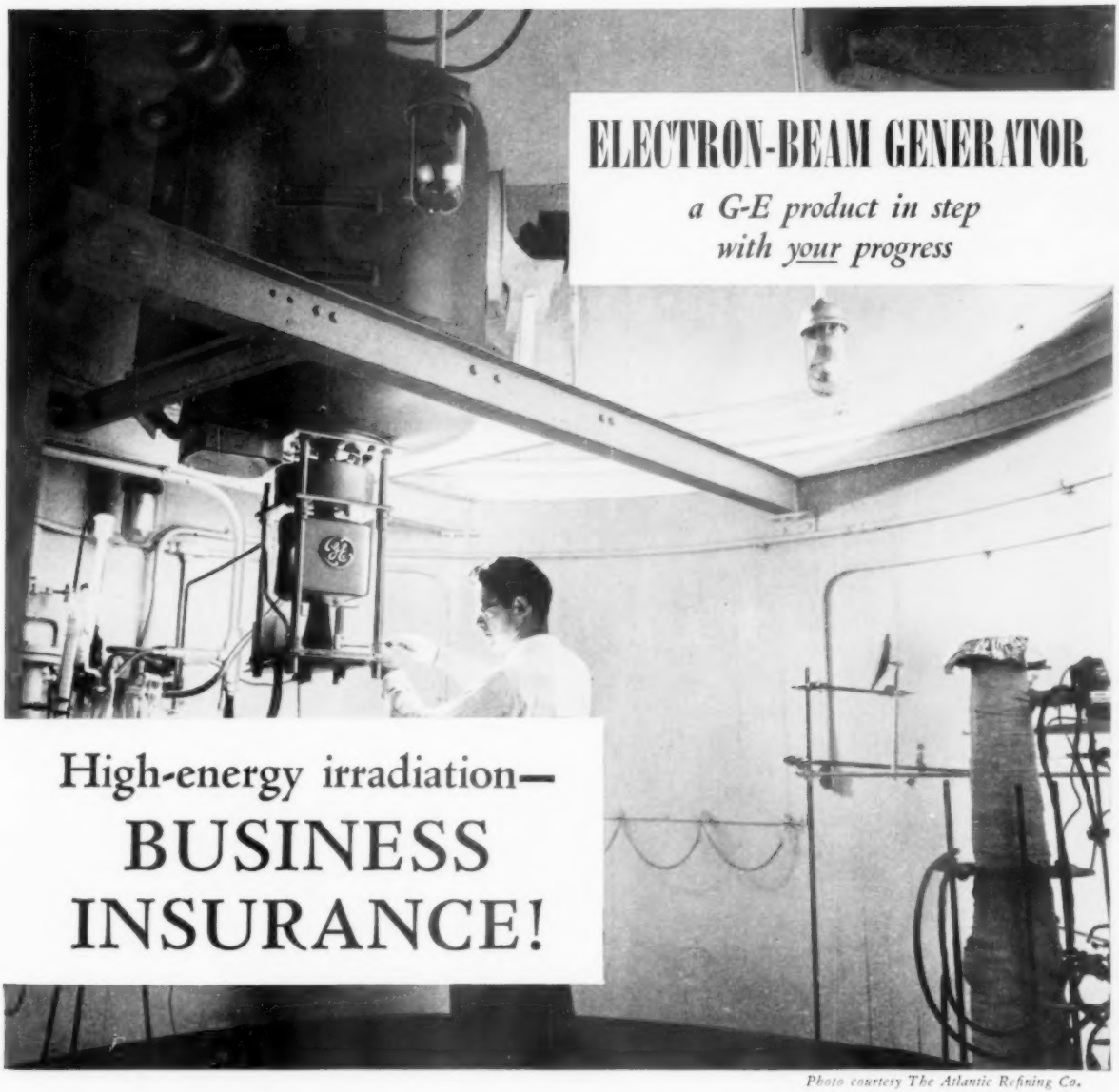
The radioisotope is incorporated into one component of the blend. Mixing activity is observed by sampling or by placing counters on a recirculation mixing line.

At the start of blending, there are large fluctuations in the radiation count. These gradually diminish until a constant count is shown between successive samples, or on the mixing-line radiation counters. The constant count means that mixing is complete.

Alternately, this method is used to measure the mixing efficiency or blending efficiency in operations such as grease-mixing or fuel-blending. Failure of the radiation count to become constant after a reasonable length of time indicates that mixing is not efficient.

Hidden leaks in process or water lines can be found by injecting a soluble radioactive tracer into the line (Fig. 6). Radiation detectors are used to locate a change in the radiation count along the line.

For water lines, radioiodine or radiosodium is used. The



High-energy irradiation— BUSINESS INSURANCE!

Photo courtesy The Atlantic Refining Co.

"Yes!" say over 200 firms who have test-irradiated products with the G-E Electron-Beam Generator

CONTINUED business success for most companies rests on their ability to develop new products or improve existing ones. Industry's hottest basic research tool in this battle for future markets is the General Electric Electron-Beam Generator.

High-energy electrons can change the fundamental structure of familiar materials — give them completely different properties. With the generator pictured above at The Atlantic Refining Co., Philadelphia, research has formed higher-octane gasolines, changed lubricant viscosity, produced hydrazine rocket fuel from ammonia.

Other products which have been test-irradiated include polyethylene, resins, cellophane, silicones, rubber, waxes and adhesives. Irradiation of catalysts promises extended life and greater efficiency.

To help you take out some "business insurance," have your G-E x-ray representative explain how you can get started by using our Milwaukee irradiation facilities. Or write for folder "Electron Chemistry—New Frontier of Science." Address X-Ray Department, General Electric Company, Milwaukee 1, Wis. Ask for Pub. PW-114.

Progress Is Our Most Important Product

GENERAL ELECTRIC

because of GLYCOLS *and* ETHANOLAMINES

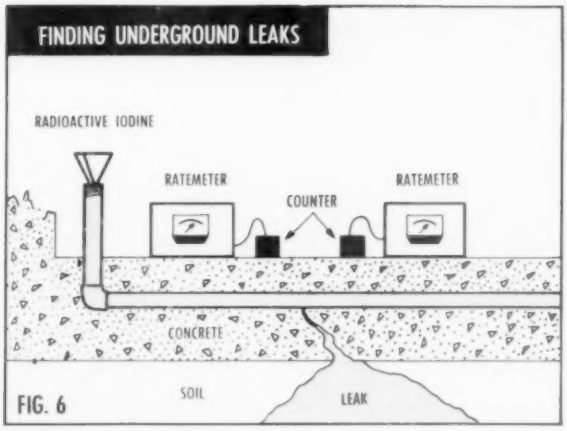
Wet or sour gases, once flared as a nuisance, now produce millions in revenue — thanks to the glycols and ethanolamines. If you use these versatile chemicals for gas dehydration or purification, you want to be sure of steady supply and instant service. Allied glycols and ethanolamines are available in tank car lots from Nitrogen Division's Orange, Texas plant, and in tank trucks or drums from warehouses in principal producing areas. Allied's technical specialists are always on call to help with any application problems you may have.

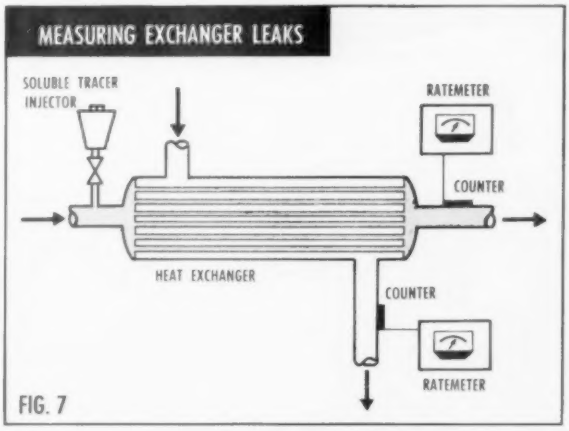
Dept. GA 1-22-6

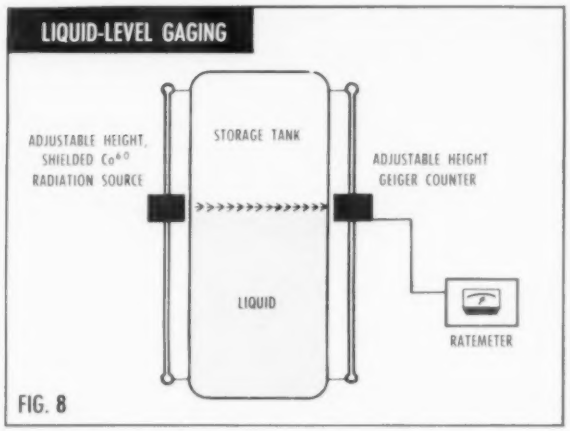
Allied Chemical — Nitrogen Division

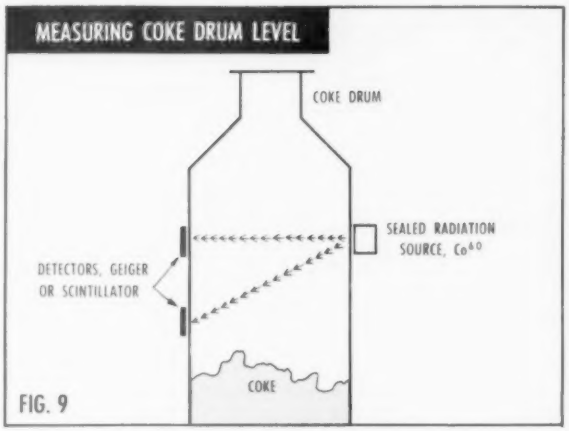
40 Rector Street, New York 6, N. Y.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Solutions • Nitrogen Tetroxide • Fertilizers & Feed Supplements









test gives quick and reliable results when other techniques fail. In some instances, this test method has been used to find and repair leaks in buildings with a minimum of damage to the structure during location and repair of the leak.

Leakage between cross-streams in a heat exchanger is being measured exactly with radioactive tracers (Fig. 7). The soluble tracer is injected into the tube-side exchanger inlet. Geiger counters are mounted on the tube-side and shell-side exit lines. If any tracer appears at the shell-side exit, there is a leak in the exchanger.

The size of the leak is found by comparing the readings from the two counters. Leaks of a few tenths of one per cent can be detected.

Liquid-level gauging is one of the most common applications of radioisotopes in the processing plant today (Fig. 8). Gauges with a sealed radioactive source can indicate when a liquid reaches a predetermined level, or they can actuate a shut-off valve on the tank-inlet line.

The radioactive source, usually cobalt-60, is in a sealed container. Often it is mounted on one side of the liquid-containing tank, with a detector on the other side. Both source and detector can be mounted to allow adjustments in height.

As the liquid level rises and crosses the radiation beam received by the detector, fewer radiation counts reach the detector. This change in counts can be made to actuate an alarm or automatic controls.

The basic principle of change in radiation count with change in fluid density can be applied to an indicator for interfaces between dissimilar fluids or liquids.

Coke-drum levels can be measured in a manner similar to that for liquid-level measurement (Fig. 9). A sealed-radiation source is used for both coke-level indication and cooling-water-level indication.

As the coke rises to the level of the radiation detector, it absorbs the gamma rays from the cobalt-60 radiation source. The arrival of gamma-ray counts at the detector decreases abruptly, and triggers an alarm.

Next, as the coke cools, its level drops below the source of radiation, and the detector receives a full measure of radiation counts. As cooling water rises above the line of radiation between the source and the detector, the radiation count again decreases to warn the operator (by an alarm)—or to control relays and automatic shut-off valves.

A second set of detectors, below the first, will give a two-level indication to show rate of coke formation.

The rate of flow of liquids in pipes can be found by the injection of a soluble radioactive tracer upstream from one or two radiation detectors (Fig. 10).

Originally, two detectors were used to find the time needed for the soluble radiotracer to travel between them.

With this time known, and the volume of the liquid between the two points also known, the flow rate could be calculated.

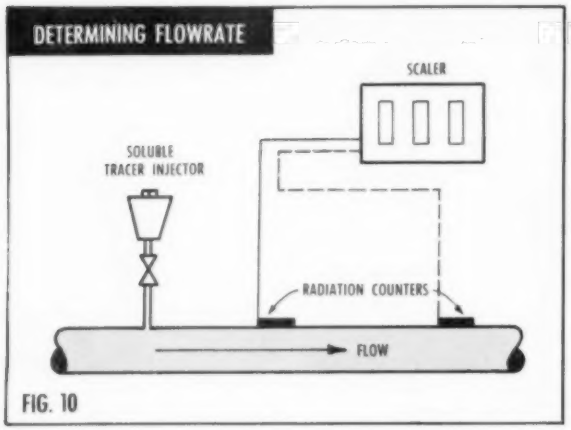


FIG. 10

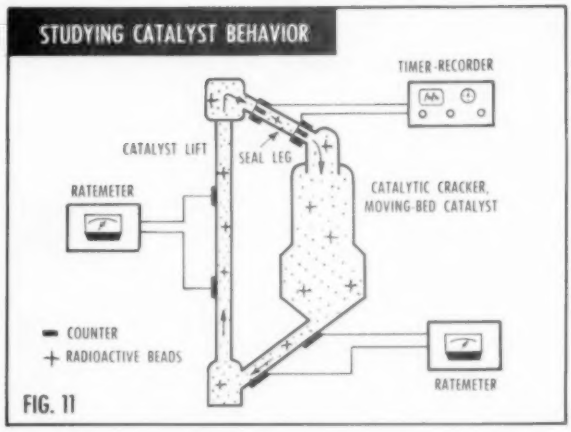


FIG. 11

The newer "integral-count" method uses only one radiation detector, and eliminates the need to know the volume of liquid between two points. This method is based on the principle that the integral number of counts (impingements on the detector from the tracer radiations) is inversely proportional to flow velocity. This is possible because the soluble tracer spreads out over a greater distance in the pipe as the flow rate increases.

Refiners are now able to study the behavior of catalyst beads in a moving-bed-type catalytic cracker by impregnating a few of the beads with radioactive zirconium, and following their movements with radiation detectors (Fig. 11).

Catalyst circulation rate in the cracker is found by using about a half-dozen radioactive beads along with the few million normal beads. Geiger counters are mounted on the upper and lower extremities of the overhead seal leg connecting the catalyst lift to the top of the reactor.

Catalyst circulation rate is easily calculated by measurement of the time it takes a radioactive catalyst bead to travel down the seal leg, if the weight of the catalyst in the seal leg is known.

In its first application, this simple test eliminated the need for a $100,000 shutdown. Today, the test is used at several refineries for routine plant control. Results have proved highly satisfactory.

Evaporator and distillation column performance can now be studied by the use of a soluble radioactive tracer in the feed stream (Fig. 12). This method has been used to study the entrainment of bottoms into the overhead stream, and to announce when a feedstock change starts to affect product from the units.

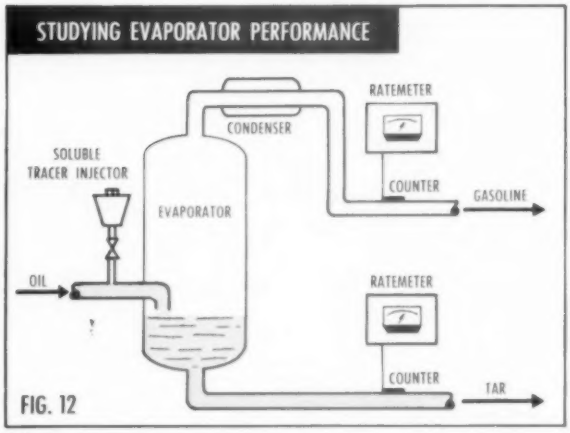


FIG. 12

An example of checking for entrainment was on an evaporator in a thermal cracking plant. Cobalt-60-naphthenate (a tar tracer) was injected into the evaporator feed.

A comparison of readings on two geiger counters (one on the overhead stream, one on the bottoms stream) made is possible to calculate the amount of tar going overhead.

These entrainment-study techniques can also apply to almost any evaporation or distillation unit. It is necessary only to select a radioactive tracer that will follow through with the desired component.

Reprints Available

Reprints of this report are being prepared, and will be available in December. Single copies will be sent to PETROLEUM WEEK subscribers on request without charge. Additional copies will be billed at the following rates: 1-10 copies, 50¢ each; 11-100, 40¢ each; 101-1,000, 30¢ each; over 1,000, 20¢ each. Address orders to:

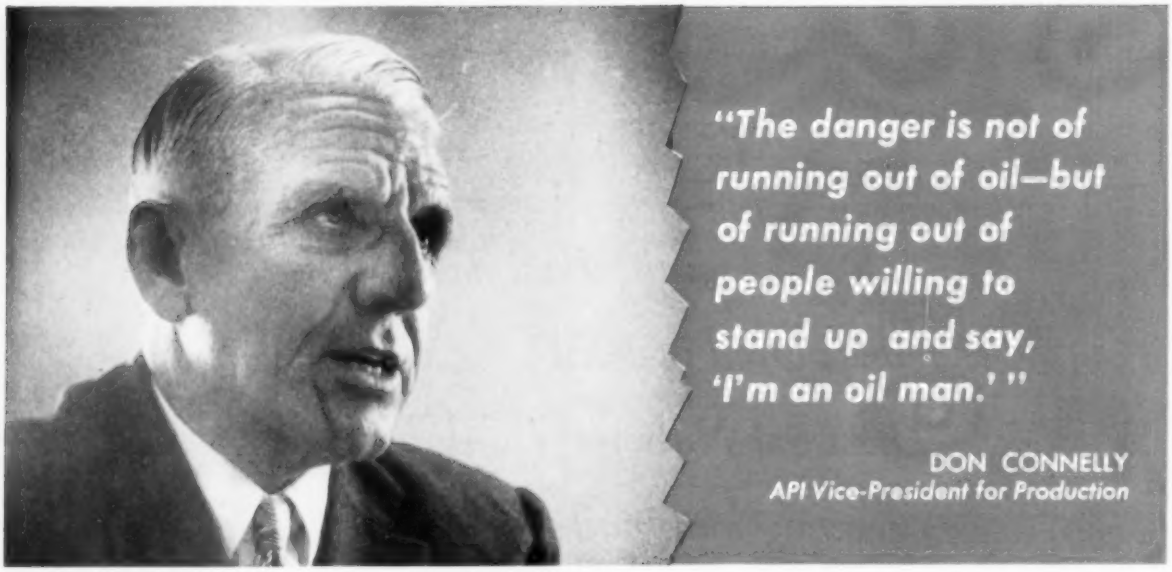
Readers Service Dept.
PETROLEUM WEEK
330 West 42nd St.
New York 36, N. Y.

When the East Texas Field was discovered in 1930, The First National Bank of Chicago was already loaning money on oil in the ground and devoting its efforts to serving the oil and gas industry. The officers of Division I, which in our bank's Divisional Organization serves the petroleum industry, speak your business language.

Glenn M. Forgan ..... Vice-President
John E. Drick ..... Vice-President
Alvin C. Johnson ..... Asst. Vice-President
Leo H. Garman ..... Asst. Cashier
Clarke C. Stayman, Jr. ..... Asst. Cashier

The First National Bank of Chicago
Dearborn, Monroe & Clark Streets
Building with Chicago Since 1863

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION


"The danger is not of running out of oil—but of running out of people willing to stand up and say, 'I'm an oil man.'"
DON CONNELLY
API Vice-President for Production

He Speaks Up for the Oil Industry

One of Donald L. Connelly's friends says he "has his foot on the accelerator all the time." This drive is one of the most important assets of the API Production Division—led by Connelly as vice-president.

Reelected at the API annual meeting in Chicago this week, Connelly will have another year to promote one of his strongest convictions:

"Oil companies," he says, "should encourage their technical people to attend the API meetings. API has been of great benefit to all of them. On standardization alone, it has saved oil companies $250-million. There's a very big potential in getting the technical people to show interest in production problems in both primary and secondary recovery."

Connelly is senior vice-president and a director of Warren Petroleum Corp. Besides running Warren's exploration and production effort as head of the company's oil division, Connelly spends considerable time throughout the year meeting with men in API's 6 divisions and 32 chapters.

"How does he do it?" repeats a Connelly associate. "His capacity for work is unlimited. He can work himself up to 900 lb. pressure on a deal. But in the middle of a serious problem he can crack a joke, release the pressure, and then hit the problem full force again."

An even bigger contribution to the industry than Connelly's API work may be his appeal to oil companies to live up to oil's traditions. He believes the industry's biggest problem is finding a way to stop the bickering between majors and independents, and to form a united front.

Speaking as an oil man, not as an API representative, Connelly says: "Surely we need not fear that the oil scientists will suddenly lose their ability and ingenuity, and that the wonderful advancements in techniques will not continue to increase the nation's supply of oil.

"What we do need to fear is any and all steps that might in some way retard or destroy the industry's operating pattern. We cannot afford an unfavorable economic climate. We must maintain an open door to opportunity."

Connelly is equally outspoken in calling upon individual oil people to "become part of the industry." In speaking to a landmen's group, he said, "The future of the domestic oil industry is bright. We are still looking for, and finding, oil. We are still building up our reserves.

"The danger is not of running out of oil—but of running out of people. Too many people work for the oil industry and believe that they are just employees. But when one is willing to stand up and say, 'I'm an oil man or oil woman,' then the future will not only be bright, but secure."

Don Connelly was born into the oil business 59 years ago as the son of an independent oil producer in Bradford, Pa. He worked on his father's rigs during the summer months between school terms.

Says one of his oldest friends, "Connelly is a great talker. If anyone ever sold the merits of Bradford, Pa., it's Don. There's a true story to prove it.

"Early in Don's oil career he worked in Tulsa and had two roommates. One of the boys was from California, while Connelly and the other fellow were from Bradford. Connelly subscribed to the Bradford newspaper, and was constantly talking about the town.

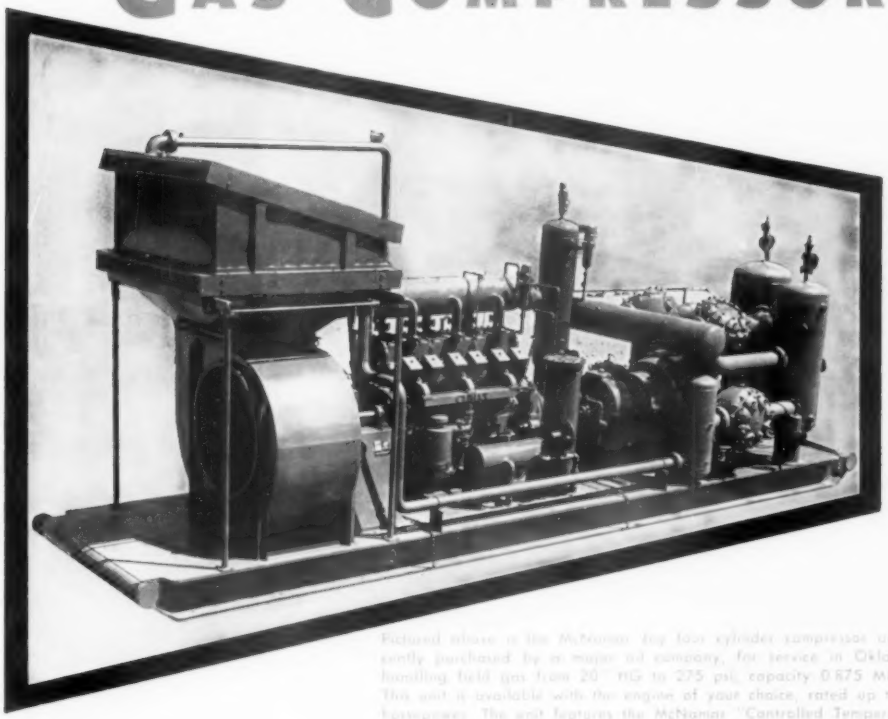
"One day the fellow from Calfornia became very sick. The two Bradford boys asked a priest to talk to the sick boy. In the course of the conversation, the priest asked the sick fellow if he wanted to go to heaven when he died. The sick boy replied that he had heard so much about Bradford that he would prefer to go there first."

Connelly's college education, at Catholic University, in Washington, D. C., was interrupted by World War I. After serving as a lieutenant in the infantry during the war, he attended Columbia University briefly.

It was in 1920 that Connelly moved to the Mid-Continent oil fields—taking his first job with National Supply Co., in Bigheart, Okla. Later he joined Tidewater Oil at Tulsa.

"There was nothing in those Osage

McNAMAR-JOY
GAS COMPRESSORS



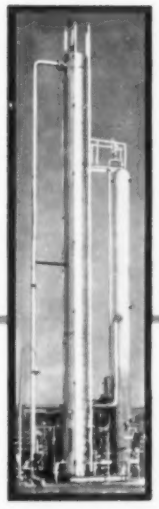
Pictured above is the McNamar big four cylinder compressor unit recently purchased by a major oil company, for service in Oklahoma, handling field gas from 20" HG to 275 psi, capacity 0.875 MMCFD. This unit is available with the engine of your choice, rated up to 400 horsepower. The unit features the McNamar "Controlled Temperature" cooling and is built to give you years of dependable service.

McNamar Joy-Gas Compressor units are available in one, two or four cylinder models. The four cylinder unit is rated up to 400 horsepower with one, two, three or four stages of compression, developing pressures up to 2,000 psi. The overall weight of this unit is 45,000 pounds.

Single cylinder, single stage units are rated to 100 horsepower. The two cylinder, single or two stage units are rated to 200 horsepower.

The McNamar-Joy unit is complete with rugged Joy compressor, gear reducer or belt drive, engine, cooling system, scrubbers, piping and safety controls mounted on a single structural steel skid.

The unit is extremely portable and can be moved on a tandem semi-trailer without disassembling. The arrangement of the equipment allows easy access to all parts for low maintenance costs.



McNamar Portable GASOLINE PLANT

The McNamar portable gasoline plant is designed for flexible application and automatic operation. Simplicity of design assures dependable operation and low maintenance costs.

The McNamar-Joy Compressor Unit is low in cost and is available on purchase, rental, or rental purchase option basis.

Call, write or wire McNamar Compressor Division for further information.

De-Sulphurization Plants Glycol and Solid Dessicant Units

McNAMAR BOILER & TANK CO.

BOX 868 — TULSA, OKLAHOMA McNAMAR TULSA CHerry 2-6291

OIL FOR TO-DAY AND TO-MORROW

BEARING FRUIT

DU PONT *Petroleum Chemicals* NEWS

Number 81 in a Series of Bulletins for the Petroleum Industry

NOVEMBER 1957

New anti-icing additive offers economic advantage to refiners

YOU OUGHT TO KNOW...

JOSEPH G. EVANS is manager of the Petroleum Chemicals Division's San Francisco district, which includes the important northern California refining area near Du Pont's tetraethyl lead plant at Antioch.

Mr. Evans joined the Du Pont Company in December, 1951. He was at first assigned to sales service in the Mid-Continent region with headquarters in Tulsa.

Prior to this he was development engineer for a stoker company in western Pennsylvania, and later organized a company distributing industrial chemicals and specialized lubricants.

Mr. Evans is a graduate of Texas A & M. During the second world war he was an officer in the U.S. Navy, on submarine duty in the Pacific. He was recalled to active duty in 1950 and served two years on a destroyer off Korea. He is a member of the Society of Automotive Engineers, National Sales Executives and the Board of Directors of the San Francisco Sales Executives' Association.

Engine stalls caused by carburetor icing have become more annoying to motorists in recent years. This is because automatic chokes and transmissions on newer cars make it difficult to prevent stalls by "gunning" the engine, especially in heavy traffic. Power brakes and steering, less effective when the engine stops, make stalls a still greater problem.

THIS DEMONSTRATION DEVICE clearly shows the causes and prevention of carburetor icing. It consists of a small ice-cooled air intake and a 1.6-horsepower engine connected to it by a transparent manifold. When unprotected gasoline is drawn through the tube, ice visibly forms and causes the engine to stall. But the addition of DMF to the gasoline maintains constant, ice-free carburetion.

More and more refiners are now using additives in gasoline to prevent carburetor icing. One of the most effective is Du Pont DMF (dimethyl formamide) antistall additive. It is economical; only a little is required for protection. In many instances, less than two milliliters of DMF per gallon of gasoline are needed to keep carburetors ice-free. Therefore DMF is economical to ship, to store and to add to gasoline.

(Continued)

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT *Petroleum Chemicals* NEWS

CONTINUED *Anti-icing additive*

Marketing advantages

Since motorists are becoming increasingly aware of carburetor icing and the stalling annoyance it causes, you can profitably feature your use of DMF in advertising and promotion campaigns.

To help you capitalize on the motorist benefit of DMF, we have prepared a number of sample ads, poster designs and sales aids (shown above). These dramatize the anti-stalling advantage of gasolines containing DMF. The ideas can be incorporated in your advertising.

Just drop us a line or get in touch with any Petroleum Chemicals Division representative.

In 1956 Du Pont spent $48,000,000 in Texas

During 1956, more than 2,000 Texas firms sold over $30,200,000 worth of goods and services to Du Pont plants in Texas. During the same year, Du Pont payrolls in Texas amounted to more than $17,700,000.

The purchases included raw materials used in chemical manufacturing . . . natural gas, butadiene, propane, ammonia, chlorine, caustic, ethylene, cyclohexane, lubricating oils, and nitric, acetic and sulfuric acids.

Small business concerns supplied many of the more unusual items and services, such as embroidery hoops and cotton gun patches used in analytical work. And a group of Texas oil well drilling experts was retained by the Victoria plant to perforate the steel casing in a 5,000-foot brine disposal well.

Watch the Du Pont "Show of the Month," CBS Network

Importance of credit cards pointed up by findings of new Du Pont survey

What do people really think about oil company credit cards? Finding the answer to that question was one of the objectives of a new study of service station customers' motivations recently completed by National Analysts, Inc., Philadelphia, for the Du Pont Petroleum Chemicals Division.

The survey revealed that 58% of the 2,036 motorists interviewed were favorably disposed toward the credit card principle. Only 16% were opposed, while 26% were undecided. Apparently *this* group is ripe for credit card promotion. An earlier Du Pont survey showed that credit card customers are more loyal to one brand of gasoline than those who do not buy on credit.

Here's why . . .

The new Du Pont survey probed also into the reasons why customers are predisposed toward credit cards. Card holders gave varying reasons for using them: for example, that they were convenient to have on trips and that they enabled motorists to buy gasoline when short of cash. A few card holders retained oil company invoices as records of gasoline and oil purchased.

In spite of the fact that the majority of service station customers' attitudes toward credit cards were favorable, only 18% of all motorists had cards. Of these, 13% had one and 5% had cards from more than one company.

Motivations vary by region

The national survey report has been analyzed to determine regional differences of habit and opinion.

These of course will prove of interest to all oil company marketing men, but especially to those with only regional distribution.

Credit cards are more widely accepted and used in the west coast and southern states.

Such information is but a small part of this new survey. The complete findings have been published in the new book, "Buying Patterns at Service Stations," now being distributed to oil company marketing executives. Requests from others in the industry will be welcomed and filled promptly.

SALES OFFICES

Chicago 3—8 So. Michigan Ave. RAndolph 6-8630
Cleveland 15—25 Prospect Ave. SUperior 1-1363
Denver 2—Petroleum Club Building, 16th & Broadway AComa 2-2347
Houston 2—705 Bank of Commerce Bldg. CApitol 5-1151
Los Angeles 17—612 So. Flower St. MAdison 5-1691
New York 20—1270 Ave. of the Americas COlumbus 5-2342
Philadelphia 2—3 Penn Center Plaza LOcust 8-3531
Pittsburgh 22—1 Gateway Center ATlantic 1-2933
San Francisco 4—111 Sutter St. EXbrook 2-6230
Seattle 3—4003 Aurora Ave. MElrose 6977
Tulsa 1—1811 So. Baltimore Ave. LUther 5-5578
In Canada—Du Pont Company of Canada (1956) Limited, Petroleum Chemicals, 85 Eglinton Ave. East, **Toronto 12**—Ontario HUdson 1-6461
In Other Countries—Organic Chemicals Department, Export Division, 7447 Nemours Bldg., Wilmington 98, Del., OLympia 4-5121, Ext. 2962.

DU PONT
REG. U.S. PAT. OFF.

Better Things for Better Living . . . *through Chemistry*

DU PONT TETRAETHYL LEAD AND OTHER PETROLEUM CHEMICALS

OVER

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

A-5449

Printed in U. S. A.

". . . every producer, large or small, is entitled to his share of the market . . ."

(CONNELLY starts on p. 128)

Hills," Connelly says, "but muddy roads."

By 1922 he was a scout and landman for Gulf Oil Corp. He has a clear recollection of one scouting assignment for a former Gulf subsidiary, Gypsy Oil Co.

"A fellow named Doc Rood," Connelly recalls, "was drilling a wildcat near Seminole, Okla. Each week the scouts stopped by to see Rood to try to get some information on the well. Each week they came back without the information.

"One week the scouts drew lots to see who would visit Rood, and I drew the chore. Rood was living in a tent at the well. I arrived at 9 a.m. and introduced myself. I told him I knew some of his relatives in Bartlesville. He seemed warm and receptive. He asked me if I could play pitch. I told him I could. We played pitch all day, and I let him win $5.75.

"About five that afternoon I decided I'd better leave, since it was beginning to snow. I felt that we were now good friends. So, in parting, I asked him about the well.

"He said, 'Son, this is a tight well, and I'll never tell anyone what's going on.'

"That was when I began to understand competition in the oil industry," says Connelly.

He was an independent scout for Gulf for a time, and an independent operator at Cisco, Tex., for two years. In 1928 he joined the old Indian Territory Illuminating Oil Co., of Bartlesville, which later became part of Cities Service Oil Co. In 1941 he was transferred to Houston, in the Texas land and geological division of Cities Service Oil.

In 1944 Connelly left Cities Service to join Warren Petroleum Corp. as head of the company's new exploration and production effort.

In the past 13 years under his leadership, Warren Petroleum's oil division has had an increase in employees from one (Connelly himself) to 350. There are now seven district offices in 17 states.

Connelly started with the belief that "the background of an oil company is its exploration department." He has tried to trim away red tape, so that his men are able to act swiftly. The men have no strict orders on where they must be at a certain time. They are told to be alert for good deals.

Connelly takes his civic and religious responsibilities seriously in his home city of Houston. He is vice-chairman of the board of trustees of the University of St. Thomas. Two years ago he was general chairman of a successful $2-million campaign for a Catholic high school in Houston.

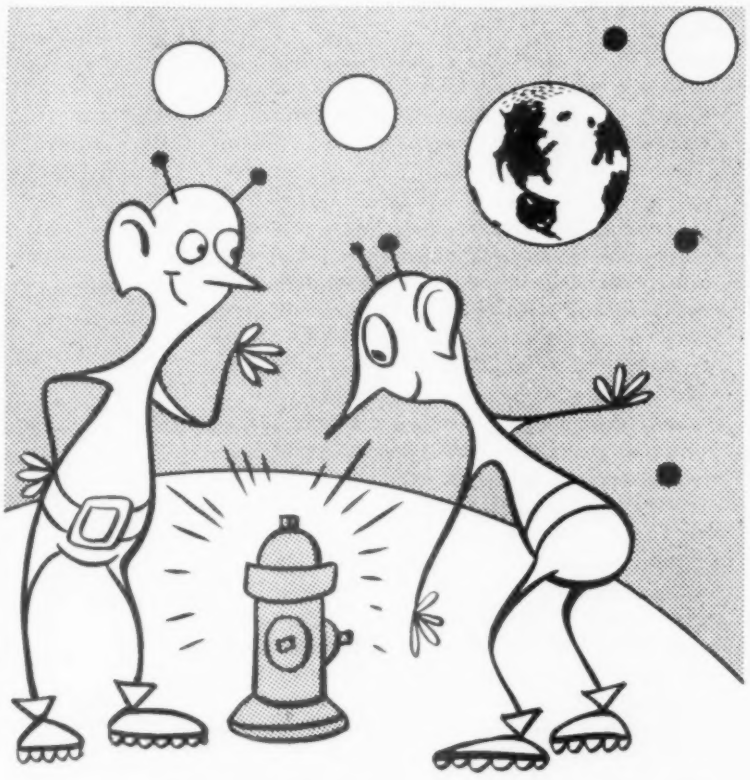
Connelly is also on the board of governors of the University of Houston, and vice-president of the university's athletic advisory committee.

He is the father of six children, with one son a trainee in Continental Oil Co.'s land department.

Looking to the future, Connelly thinks the industry will be healthy if the producer remains healthy.

"Every producer," he says, "large or small, is entitled to his share of the market. Production must be regulated by the states to market demand so every producer can have a market."

Connelly adds, "We will have our biggest challenge when all of the oil has been recovered by present recovery methods. Then new recovery methods will have to be developed. But we have met challenges before—and we will meet this one."



". . . and PARKHILL'S stringing the pipe!"

Anywhere . . . anytime!
Parkhill has the men, the equipment
and the experience to handle your next pipe
stringing job, large or small. Give us a call
and park your problems with Parkhill.

PARKHILL TRUCK COMPANY
TULSA, OKLAHOMA

BASIC RESEARCH . . .
More Practical Than You Think

This editorial, one of a special series on the importance of research to the American economy, deals with an aspect of our research program that may have serious consequences in future years — the lag in basic research.

An earlier editorial in this series noted: "The keen interest of U. S. business firms in scientific research points the way to a new kind of prosperity for our economy — a prosperity based on deliberate creativeness." As a result of the dramatic increase in industry's research expenditures, more new products will be introduced in the years 1957-1960 than in any previous four-year period.

A steady stream of new products and new processes means better values for consumers and lower costs for business. And thus it promises to sustain a high level of general prosperity that defies the old laws of boom and bust. **But, as we look further ahead, there is a danger that the stream of research discoveries may run dry because of our neglect of basic research.**

This danger was described by John Jay Hopkins, late founder and chairman of the General Dynamics Corporation: "Unless there is a revolutionary development in America of pure, not applied, science, there will come a day when there is no use in trading in your old car; because the new one is no better. The only difference between this year's television set and next year's will be the appearance of the cabinet! Scientific progress will be replaced by scientific stagnation."

What Basic Research Is

Basic (or pure) research has been characterized as the pursuit of knowledge for its own sake rather than to fulfill some practical objective. It is generally carried out in an environment which allows the investigator the freedom to follow the lead of his curiosity. The scientist in basic research, in the words of Glenn T. Seaborg of the University of California, is not concerned with "utilitarian goals, but a search for deeper understanding of the universe and the living and inorganic phenomena within it."

Impractical as basic research may seem in its initial purpose, it is an essential prerequisite to applied research and product development. A few examples will show how some of the greatest technical advances of recent years have come from basic research projects that had no immediate practical objective:

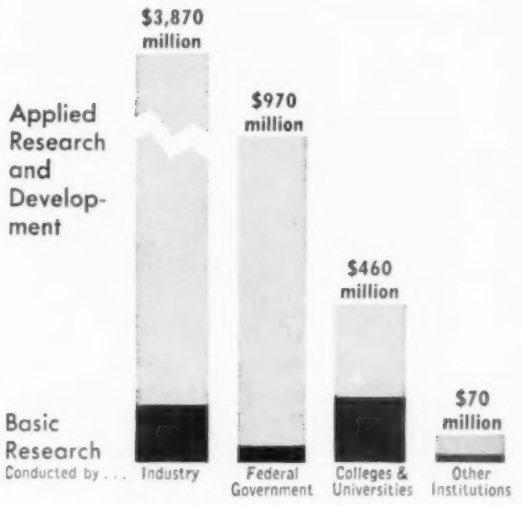
- **Radar** — an important military development of World War II with broadening commercial applications — was the outgrowth of a basic research project whose purpose was to obtain information about the height of the ionosphere, the layer of air that lies some 25 miles above the earth's surface.

- **Transistors** — the miniature devices which are already vital components of hearing aids, pocket radios and a wide variety of industrial equipment — were invented at Bell Laboratories (research subsidiary of the American Telegraph and Telephone Company) following university investigations into the electrical behavior of solids.

- **Neoprene** — a synthetic rubber — was developed by duPont with the help of basic information provided by Father Nieuwland of Notre Dame, who discovered he could control the polymerization (the linking together of molecules) of a certain class of organic compounds.

- **Nylon** — the first of the noncellulosic synthetic fibers that have revolutionized the textile industry — grew out of fundamental research by Dr. Wallace Carothers on long-chain polymers.

Only 8% of All Research and Development in the U. S. is Devoted to Basic Research



Data: National Science Foundation, "Funds for Basic Research in the United States, 1953"

Industry's Stake in Basic Research

Industry traditionally has relied upon colleges and universities and other nonprofit institutions for basic research; and the U. S. has long benefited from the greater emphasis placed on basic research in Europe. It is conventional to think that business cannot, and should not, do much about "ivory tower" projects which do not have immediate practical application.

However, there is not so much in this idea as is supposed. The examples above illustrate what Caryl Haskins, president of the Carnegie Institution, has called "the widespread paradox that the most important practical consequences are commonly the least sought after." Furthermore, it is certain that, without adequate basic research, industry's efforts to produce new and better products will become progressively more difficult. And our national defense, in an age of breathtaking military applications of science, will become increasingly precarious.

In the past, our economic growth came largely through expansion into new lands or through discovery and development of rich deposits of natural resources. Such opportunities are relatively limited today. The great opportunities now lie in discovering new materials and new properties of the materials we already have. **This is the job of basic research, and industry has a vital stake in it.**

The chart indicates the tiny share of research efforts in the U.S. that is devoted to basic research. **Only 4% of all research by industry, and only 8% of all research in the U.S., during the year 1953** (the latest for which information is available) **represented fundamental research to add to overall scientific knowledge.** Even in colleges and universities less than half the research performed is basic research. At least one Nobel Prize winner has expressed the belief that we need and should work toward a doubling of the proportion of our total research effort that is devoted to basic research as soon as possible.

What Business Can Do

Without anything like a staggering increase in the total cost of its research programs, industry could do much to expand our basic research effort. Companies with big research programs should, as a matter of successful survival, be devoting a share of the effort in their own laboratories to basic research. Significantly, companies that are already doing a notable job of basic research have also made an outstanding record of translating such research into new products for industry and the consumer.

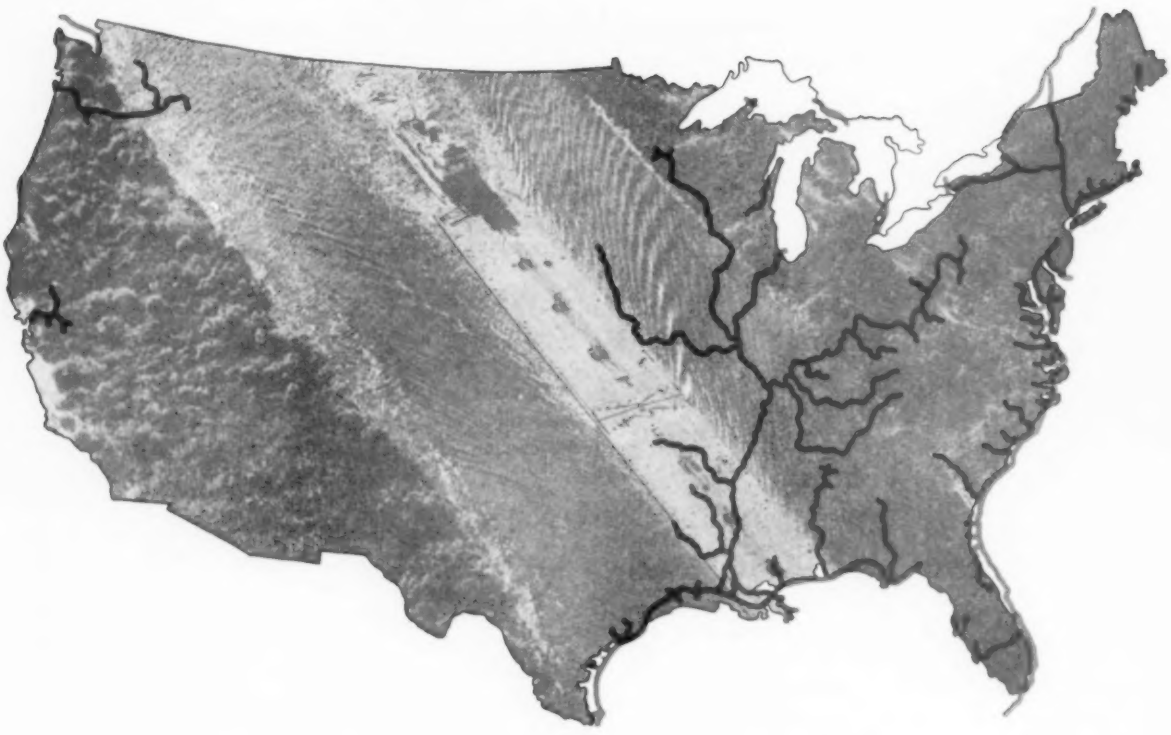
Smaller companies may rightly regard the conduct of research projects with uncertain prospects of reward as a luxury. Some basic research, indeed, never results in any tangible payoff. But, with modest contributions, small companies can still have a part in the advance of basic research. They can join together with other companies on cooperative projects. They can support basic research through trade associations and technical societies. They can help research centers in universities and other nonprofit institutions. Arrangements are available in some instances whereby business firms can pay a fee to have access to work done by university researchers.

One way or another, it is up to private business firms to see that basic research moves forward. By doing so they will be laying the groundwork for the development of the new products and technology on which their growth, and the growth of the economy, depend.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.



Crude, Products Barging Is Slipping

- **Despite an increasing volume of crude and products shipped on inland waterways, barge operators are gradually losing out to pipelines for this business.**

- **Coming for bargers: increased emphasis on long-term contracts and specialty hauling. Also, more mergers will result in larger, but fewer inland water carriers.**

Inland water carriers, long dependent on the oil industry for a major part of their business, are making it plain that they intend to keep that business—or bust trying.

The bargers' fight to stay in the oil transportation business is as significant to oil men as it is to the water carriers themselves. That's because of the important role water carriers have played and are playing in crude and product movement.

Any change in the crude and product load carried on the inland waterways means a corresponding change for the competitive means of transportation—pipelines, railroads, and trucks.

And there have been changes in the water carriers' load of late, mostly unfavorable to bargers.

A PETROLEUM WEEK spot-check of inland water carriers, however, shows that these firms don't intend to "pass quietly" from the petroleum transportation scene.

On the surface, barge operators would appear to have nothing to worry about: Movement of crude and products on the nation's inland waterways (excluding the Great Lakes) increased from 104-million tons in 1950 to 129-million tons last year (chart, page 138).

The increase in crude shipments during the period—from about 26-million tons to about 28-million tons—is less dramatic than some of the increases in product shipments by barge during the same period. Motor fuels, for instance (including all blending agents of petroleum origin), jumped up from about 31-million tons in 1950 to over 39-million tons last year.

Gas, oil and distillates shipped on inland waterways rose from 19.5-million tons to more than 27-million tons over the seven years.

Asphalt, a minor product in 1950, when only 474,868 tons of it moved on inland waterways, had taken on new importance by last year, when 1.3-million tons moved.

Other products whose shipments on inland waterways increased were residual fuels, lubes, and greases. Kerosine and natural gasoline shipments declined during the period.

Crude and product movement on some inland waterways—from Texas to the South Atlantic, and from Louisiana up along the southern Mississippi, for instance—have shown remarkable gains over the same period.

In 1950, about 1.3-million bbl.—just about all of it in products—moved from Texas ports to South Atlantic ports. Last year, the total, again made up of refined products, was near 4.2-million bbl.

Waterway shipments from Louisi-

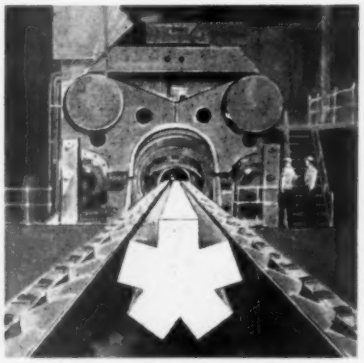
See this Exhibit of

ADVANCED METALS PROCESSING

New methods for improved quality and lowered costs

Pouring an ingot from an electric furnace.

Billet entering giant extrusion press.



Extrusion press produces varied shapes.

- ★ Metallurgists
- ★ Engineers
- ★ Designers
- ★ Purchasing Agents

in the following fields

- ★ Utilities (electric)
- ★ Power
- ★ Petrochemical
- ★ Ordnance
- ★ Piping Fabrication
- ★ Chemical Processing
- ★ Turbine Manufacture
- ★ Aircraft
- ★ Missiles
- ★ Automotive
- ★ Truck, Tractor and Farm Equipment
- ★ Materials Handling Equipment
- ★ Construction

By Invitation

For your convenience and comfort, this demonstration is not being opened to the general public. If you wish to see the exhibit, but have not received an invitation, please present your card, indicating your business affiliation and address, at the special reception desk at the entrance to the Waldorf Suite.

Waldorf Suite at the Waldorf-Astoria, New York City

November 18 . . . from 3:00 p.m. to 9:00 p.m.
November 19-20-21 . . . from 10:00 a.m. to 9:00 p.m.

Learn about new processes used to fabricate vacuum melted high purity alloys, stainless steels, super-alloys, titanium and other advanced metals to meet the critical requirements of tomorrow's power, nuclear, chemical, oil refining, missile and other applications.

See dramatic exhibits of tubular products and shapes extruded from stainless and chrome moly steel alloy ingots that have higher transverse properties, in many cases, equal to the longitudinal properties — of particular importance in pressure retention applications — and a high ratio of tensile properties to ductility. Examine metal products formed from cross extrusions of vacuum melted ingots at a 90:1 reduction ratio, yielding 15% to 100% more in transverse and longitudinal impact strength; up to 100% increase in ductility; and up to 100% increase in fatigue strength.

See super-alloys M-252 and A-286 extruded for high service stresses at 1500 degrees to 1600 degrees Fahrenheit and view new process pinion gears made by Metals Processing Division.

On display will be a scale model of the world's largest horizontal steel extrusion press at Metals Processing Division. You will see impact testers, high temperature tensile testers and stress rupture machines substantiating the improved properties created in wrought and cast products by Metals Processing Division's unusual techniques over a temperature range from minus 40 degrees Fahrenheit to 1600 degrees Fahrenheit.

On display are 90mm gun barrel tubes extruded to save hours of machining, and a 46 ft. long, large diameter, weld-free alloy steel pipe — for power, nuclear, petro-chemical and oil refinery applications. Precision forged and extruded hydraulic cylinders and extruded rocket tube bodies for guided missiles will be exhibited.

Metallurgists will find special interest in the advanced metallurgical techniques. Engineers will find new pathways charted for new products and applications.

An appropriate brochure containing valuable technical data will be distributed at the exhibit.

CURTISS-WRIGHT CW

CORPORATION

ana to ports on the lower Mississippi also tell an interesting growth story: 2.9-million bbl. in 1950; 4.1-million bbl. last year.

But barge operators take little comfort in such figures. They know that every year they're getting a slightly narrower wedge of the constantly growing oil transportation pie (chart, below).

The figures bear them out. In 1950 water carriers had 34.5% of the total crude and product carrying business, according to figures from the Committee for Oil Pipelines.

Since then, water carriers' percentage has been slipping slightly every year: 33.2% in 1951, 33% in 1952, 31.7% in 1953, 30.6% in 1954, and 29.7% in 1955.

Pipelines are estimated to have handled 38.8% of the total crude and products transported in 1950, 40.3% in 1951, 40.6% in 1952, 41.6% in 1955.

Water carriers' losses in oil business have been suffered mostly in product movement.

Their gradually decreasing importance in oil transportation spans the period in which product pipelines have made their greatest advances—the years from 1947 to the present.

In 1947, water carriers hauled about 45% of all petroleum products moved in the U.S., while product pipelines handled 10%. In 1955, however, water carriers had only 38% of the product hauling business, while pipelines had 20% (PW—May3'57,p42).

Barge operators know where their oil business is going. They're the first to admit that new pipelines have quite often hit them hard.

One official of a large barging firm told PETROLEUM WEEK, "Anyone who says pipelines haven't hurt the barge business is crazy. There would be 50% more barges in operation today if it hadn't been for pipelines."

Bargers are quick to point out that it was always this way. "Take the Bayou Pipe Line, for instance," one observes. "That runs from Houston to

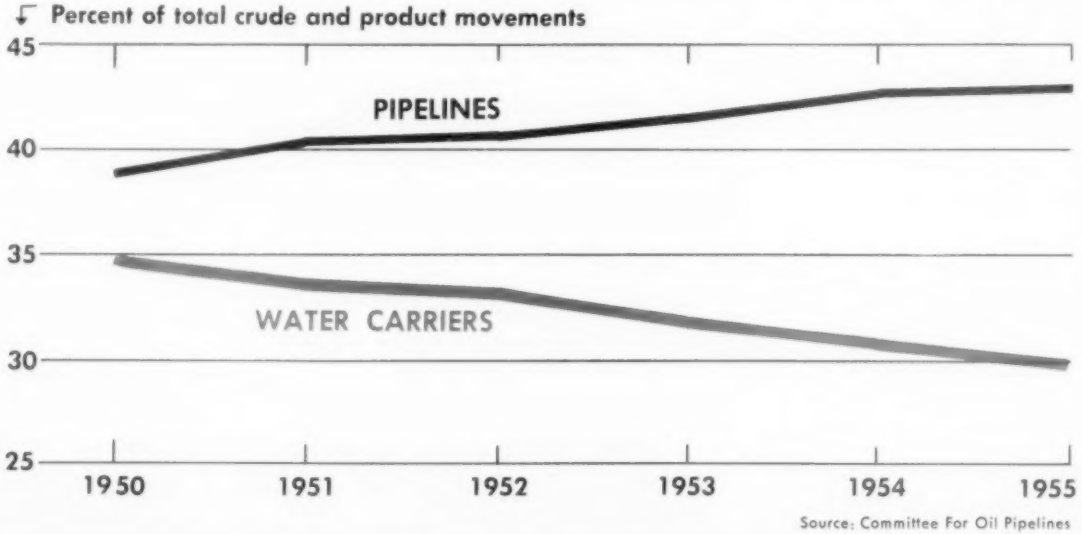
Inland waterways are carrying more crude and products...

(thousands of net tons)

	1950	1951	1952	1953	1954	1955	1956
Crude	26,111	27,131	32,120	27,584	22,837	24,218	28,081
PRODUCTS							
Motor fuels	31,195	33,658	36,482	36,370	35,761	38,096	39,192
Gas oil, distillates	19,508	23,326	24,049	23,415	24,314	26,430	27,367
Residual fuel	20,289	20,802	21,345	20,230	20,529	23,964	24,993
Kerosine	3,602	3,983	4,194	3,536	3,204	2,950	3,185
Lubes, Greases	1,136	1,875	1,835	2,180	1,234	1,400	1,778
Asphalt	475	567	640	608	880	1,299	1,377
Natural Gasoline	219	217	300	63	37	136	185
Others	1,635	1,934	1,932	1,446	2,100	2,742	3,190
Total	**104,169**	**113,494**	**122,897**	**115,431**	**110,896**	**121,235**	**129,348**

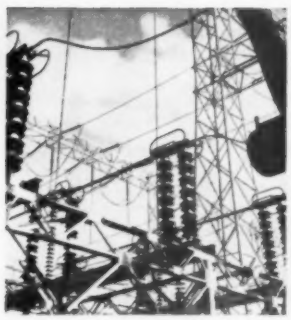
Source: Corps of Engineers, Dept. of Army
Prepared by American Waterways Operators, Inc.

...But their share of the total is steadily declining.



Source: Committee For Oil Pipelines

STEEL, with its giant equipment, uses Cities Service lubricants in mounting quantities. The list of Cities Service customers reads like a "Who's Who" of steel.



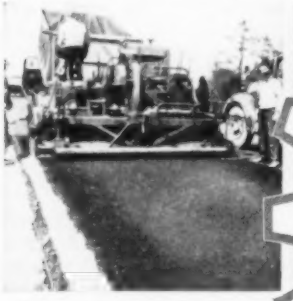
ELECTRIC POWER companies use Cities Service Diesel Lubricating Oil to set low-cost power generating records. Proof again of the high quality of Cities Service Oils.

MACHINE SHOPS find Cities Service Cutting Oils the answer to longer tool life and greater precision. Cities Service makes cutting oils for every job requirement.

PAPER requires huge quantities of highly refined wax. The best is Cities Service Pacemaker . . . used for milk cartons, wax paper, straws and many other products.

MINING is both a quantity and quality user of lubricants. Cities Service tailors precision lubricants to serve this basic industry, symbolized by the famous Mesabi Iron Range.

FARMING is more and more a mechanized industry, and more and more an important Cities Service customer. Farming uses more petroleum than any other industry.



ROAD BUILDING calls for enormous quantities of Cities Service petroleum products—all the way from fuels to lubricants to asphalt topping. Future demand looms larger and larger, as America launches the greatest highway building program in history.

Geared to the needs of fast rolling American Industry

AVIATION, with its mounting requirements of higher octane gasolene and jet fuels, finds Cities Service a major supplier. With its ultramodern refinery facilities, Cities Service is capable of producing aviation fuel components in huge quantities.

CITIES SERVICE

Baton Rouge. Well, if the crude that goes through this line were moved by barge, it would represent about 500,000 bbl. of barge capacity.

"That's business we would have got, years ago. But not any more."

Most bargers are just as quick to bemoan new pipelines: The same official says that the recently announced plans of Shell Pipe Line Co. to build a trunk line from its South Pass Terminal in the Gulf of Mexico to its Norco (La.) refinery (PW—Oct.11 '57,p85) "would probably eliminate four or five tows."

That's why bargers are doing their utmost in an attempt to block use of the Little Inch Line as a petroleum products carrier.

Conversion of the Texas Eastern Transmission Co. line from natural gas to petroleum products service is now virtually completed. But use of the line to carry products from the Southwest into eastern and midwestern markets still seems a long way off, because of involved court action brought by barge operators contesting the conversion.

Some barge operators are really bitter about the Little Inch matter: One, who ships a good deal of petroleum products up the Mississippi to Midwestern markets, says that the "Little Inch reconversion isn't necessary except for use during war-time. . . . The Little Inch will take away a hell of a lot of business from the barge industry."

A vice-president of a Houston-based water carrier puts it this way: "I don't know what the tariff will be on the Little Inch, but I do know the pipeline will set the rates and barges will have to compete. The barge business will still be attractive to a lot of spot buyers of products. That's because occasional users won't be able to use the Little Inch, since there won't be any common storage facilities."

Competition with pipelines—and with each other—has kept crude and products barge rates lower than barge operators feel is healthy.

Average spot barge rates for voyages of 1,000 mi. on the Mississippi River System for petroleum products have shown a decided tendency to decrease during the past two years, according to figures compiled by C. J. Thibodeaux & Co., a large Houston barge broker. The rate for this past September was about 0.22¢ per ton-mile, as compared with an average of 0.27¢ per ton-mile for the period from August, 1945, to June of this year.

"And right now," he contends, "rates are from 20% to 25% under what they should be to make barging an attractive business."

And bargers (like everyone else) are faced with rising operating costs.

A veteran barge operator says that "the crying need is for higher rates because the cost of building barges has gone up considerably. Back in the early 40s barges could be built for between $2.50 and $3.00 per bbl. The same barge costs $8 to $10 per bbl. today.

"And a tug today costs $250,000, while the same tug before the war cost $125,000."

Most barge operators are mapping plans to keep their oil business with great care, because crude and product hauling is still a source of big income for them.

American Waterways Operators, Inc., estimates that in 1956 crude and product traffic on the nation's inland waterways totalled 129.3-million net tons, over one-third of the total commercial traffic on such waterways (about 384-million net tons).

And the oil business is important to bargers in every section of the country. Crude and product shipments are larger than any other commodity shipments on all of the following inland waterways:

Columbia River, Cumberland River, Sacramento River, the Mississippi System, the Houston Ship Channel, the Gulf and Atlantic Intracoastal Waterways, Chesapeake Bay, Potomac River, Delaware River, Hudson River, and the New York State Barge Canal.

One way bargers expect to keep much of the oil business is by pushing operating efficiency even harder than they have in recent years.

More efficient operation, to bargers' way of thinking, means larger payloads moving at good speeds.

"The barging business," one long-time barger recalls, "started out with small units—9,000-bbl. capacity—with three of these units making a tow. As the volume increased, it was apparent that larger barges had to be built. Now we've got 25,000-bbl. barges with two, three, four, or more of 'em making a tow."

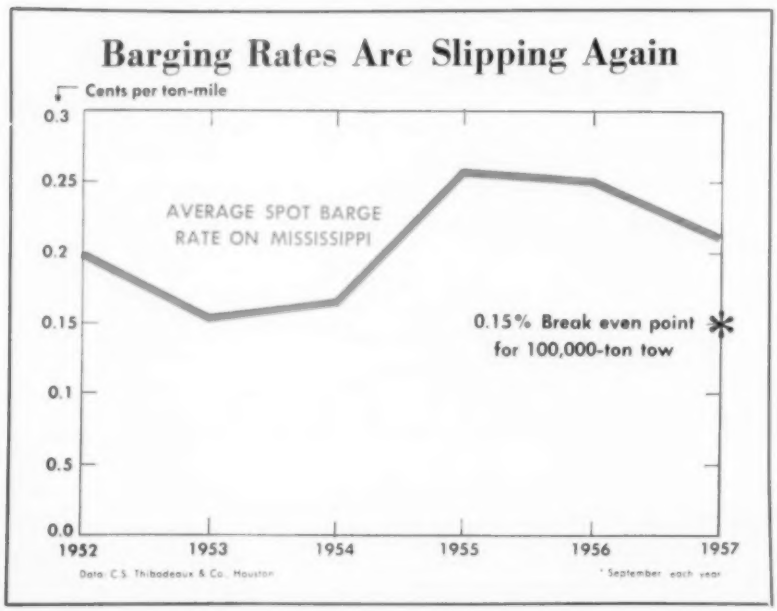
Tows now range from 7,500 tons to 10,000 tons (although a little while back a 5,000-ton tow was the largest available). Such towboats are increasing in horsepower, not to get more speed, but to be able to accommodate greater-capacity barges at the same speed. This, barge operators feel, is the only way to make the money.

"The only reason barge operators are able to operate today with rates so similar to the rates of 15 years ago in the light of higher costs," one operator maintains, "is the efficiency of operation. And continued attention to efficiency is all that will keep many in business.

"Today's barges have lower rakes (slanting ends, which decrease drag), and integrated tows with no water between the barges to offer resistance. Also, diesel engines for the tugs have been greatly improved, as have tug hull designs."

Most bargers also intend to shoot for more of the specialty-product business.

Barge operators polled by PETROLEUM WEEK see their greatest future increase in business coming from hauling specialties—paraffin, asphalt, lube



oils, and, perhaps some day, LP-gas.

Some specialties can be moved in regular product barges. But such barges must be kept stringently clean, to keep contamination of the "delicate" specialties to a minimum.

However, a good many specialties require special barges, or at least special coating or special lining of regular barges. The volume of these products is at present far below that of other petroleum products. But some bargers are already building special barges to carry such specialties in anticipation of great demand gains for the specialties.

"Barge men," one executive says, "simply must diversify their operations in such fields as chemical and petrochemicals."

And they'll be asking for longer-term contracts, too.

The vice-president of one water carrier that does a brisk trade in crude and products told PETROLEUM WEEK that more long-term contracts are a certainty:

"From the shipper's point of view, long term contracts haven't always been desirable. The shipper didn't have enough confidence in the barge operator to trust him with his products over a long period of time.

"In other words, the barge man had to prove his dependability. He has done that. And today the shippers have a growing confidence in the barge man.

"In the next five to ten years, almost all barge business will be conducted under long-term contracts."

There is some real optimism in the barging camp concerning the possibility of retaining most—if not all—of its oil business. Flexibility, some feel, is the important advantage of the barging operation that could turn the trick.

This school of thought is best summed up in the words of one barge line official: "Pipelines have one point of origin and one point of destination. Barges, however, can pick up and deliver at numerous points. Pipelines just can't give that kind of flexibility. So there will always be room for our kind of operations."

The "optimists" also say that increasing demand will play an important part in a sustained crude and products barging business.

A spokesman for another barging firm says, "The adverse effect of new pipelines on the barging business can be overemphasized.

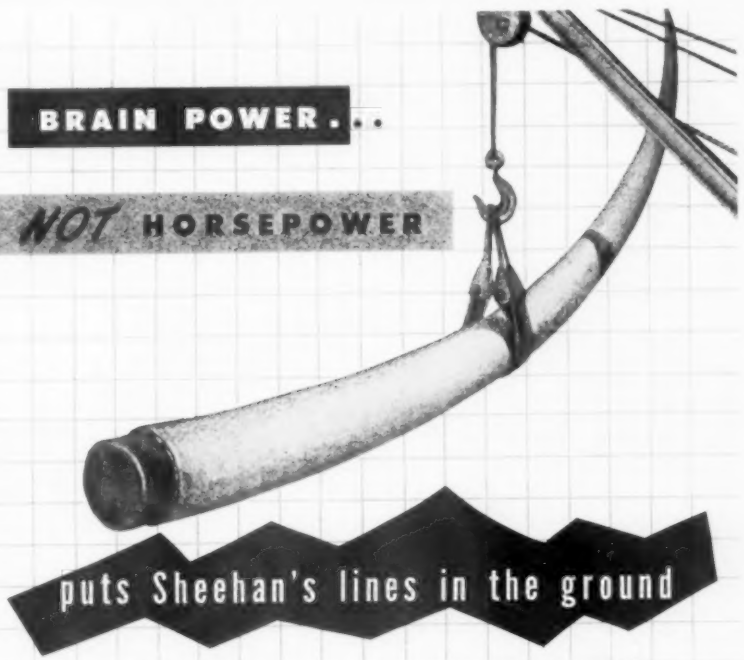
"Take the Little Inch case, for instance. Until the consumption of products increases to the point where it exceeds the Little Inch capacity, the line certainly will have an adverse effect on our operations on the Ohio and Mississippi Rivers. But in two or three years, we feel there will be enough increased consumption to exceed the line's capacity. Then the barging people can step right back into the picture in a big way."

But there are bargers who see cold, dark days ahead. One opinion: Inevitable mergers of inland water carriers, already beginning, will result in a 25% reduction in the number of such firms within five years.

Commercial Transport Corp. and American Barge Line Co. may have set the pattern for many bargers back in August, when they merged to form American Commercial Barge Line, now one of the largest inland waterways enterprises in the world.

One firm certainly feels that this is the case. Its vice-president told PETROLEUM WEEK, "The small barge man can't survive on today's rates.

"There are a lot of companies in the business, and some unqualified men will drop out in the next few years." His guess: "Easily 25%, if we continue to have normal business. But a war might increase our numbers from the present 200 to 500."



A pipeline's eventual success in meeting time and cost requirements is largely determined many months before the big angledozers and ditchers start gnawing up the right-of-way.

Employing only highly trained experts with a solid background of practical, on-the-job experience, and a thorough understanding of the economics of construction, Sheehan provides for its customers the ultimate in this all-important step to successful pipeline installation.

Let Sheehan's experience work for you on your next pipe line project.

SHEEHAN PIPE LINE CONSTRUCTION CO. TULSA OKLA

SHEEHAN

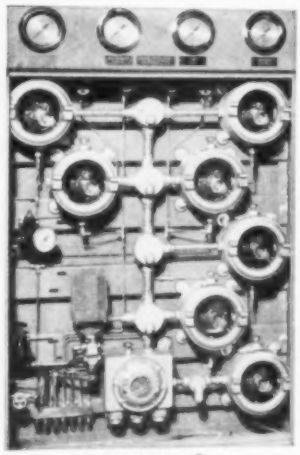
NATIONAL BANK OF TULSA BUILDING

TULSA, OKLAHOMA

BUILT TO LAST

THE LIFE OF THE EQUIPMENT IT SERVES

MERCOID®
SAFETY CONTROL PANELS



MERCONTROL®

Here are a few of the many functions Mercoid Controls perform in safeguarding major pipeline equipment:

- *High discharge pressure*
- *High case pressure*
- *Low suction pressure*
- *High case temperature*
- *High bearing temperature*
- *Lube oil pressure*
- *Instrument air pressure*
- *Mechanical seal failure*
- *Differential pressure for pressurized control rooms*

Our engineers are at your service —send in your control problem.

THE MERCOID CORPORATION
4201 Belmont Ave., Chicago 41, Ill.

What's New / IN TRANSPORTATION

Are Atom Tankers Ten Years Away?

A marine transportation expert says that nuclear-propelled merchant ships are at least ten years away.

Harry B. Benford, of the University of Michigan's Dept. of naval Architecture & Marine Engineering, made the prediction at this week's meeting of the American Petroleum Institute in Chicago.

Benford, addressing API's Division of Transportation, said that it now appears "unlikely that nuclear-propelled merchant ships will become commercially competitive [with conventional vessels] within ten years unless costs can be brought down more rapidly than is now thought possible."

Benford also predicted that optimum speeds for nuclear tankers "will not greatly exceed optimum speeds for conventional tankers."

France is looking into the feasibility of nuclear tankers, too.

Most of the headlines concerning proposed nuclear tankers have been going to the U.S., Britain, and Japan. Recently, however, industrial groups working with the French Atomic Energy Commission were invited to submit "projects" for a 40,000-ton nuclear-powered tanker that would develop about 20,000-hp.

The "projects" will be examined by France's Atomic Energy Committee and Merchant Marine Ministry, which are working jointly on the proposed tanker.

•

More Oklahoma Gas For Northern Natural

Northern Natural Gas Co. has completed a 20-mi. gathering line in northwestern Oklahoma to tie in with its lines from Texas-New Mexico to the St. Paul-Minneapolis area.

The new gathering line will tie in eight gas wells in the Gate Lake field of Harper County, and the South Glenwood pool of Beaver County. The tie-in will bring an additional 14-million cu. ft. of gas daily into the Northern trunk.

The gathering line consists of 5 mi. of 8-in. line, 10 mi. of 6-in. line, and 5 mi. of 4-in. line.

Texas Engineering & Construction Co. was contractor for the job.

•

Pipeline to Tar Sands

Bituminous Oil Pipe Line Co. is planning a 250-mi. crude trunk from the McMurray (Alta.) tar sands to Edmonton.

Bituminous Oil, a subsidiary of Royalite Oil Co., Ltd., said recently that it would apply this week to the Alberta government for permission to build the line.

•

An expansion program at Kaiser Steel Corp.'s Napa (Calif.) fabricating plant will double the plant's pipemaking capacity and enable it to produce 42-in. pipe. The $2-million program now getting under way will make the plant one of the largest in the world for fabricating oil and gas line pipe.

•

Jones & Laughlin Steel Corp. is now marketing Electricweld line pipe in sizes from 6⅝ in. to 12¾ in. J & L is making the new lines, it says, in response to a steadily increasing demand for its tubular products. The company says that "the development of advanced techniques that have greatly reduced pipe corrosion" has sparked the rising demand.

•

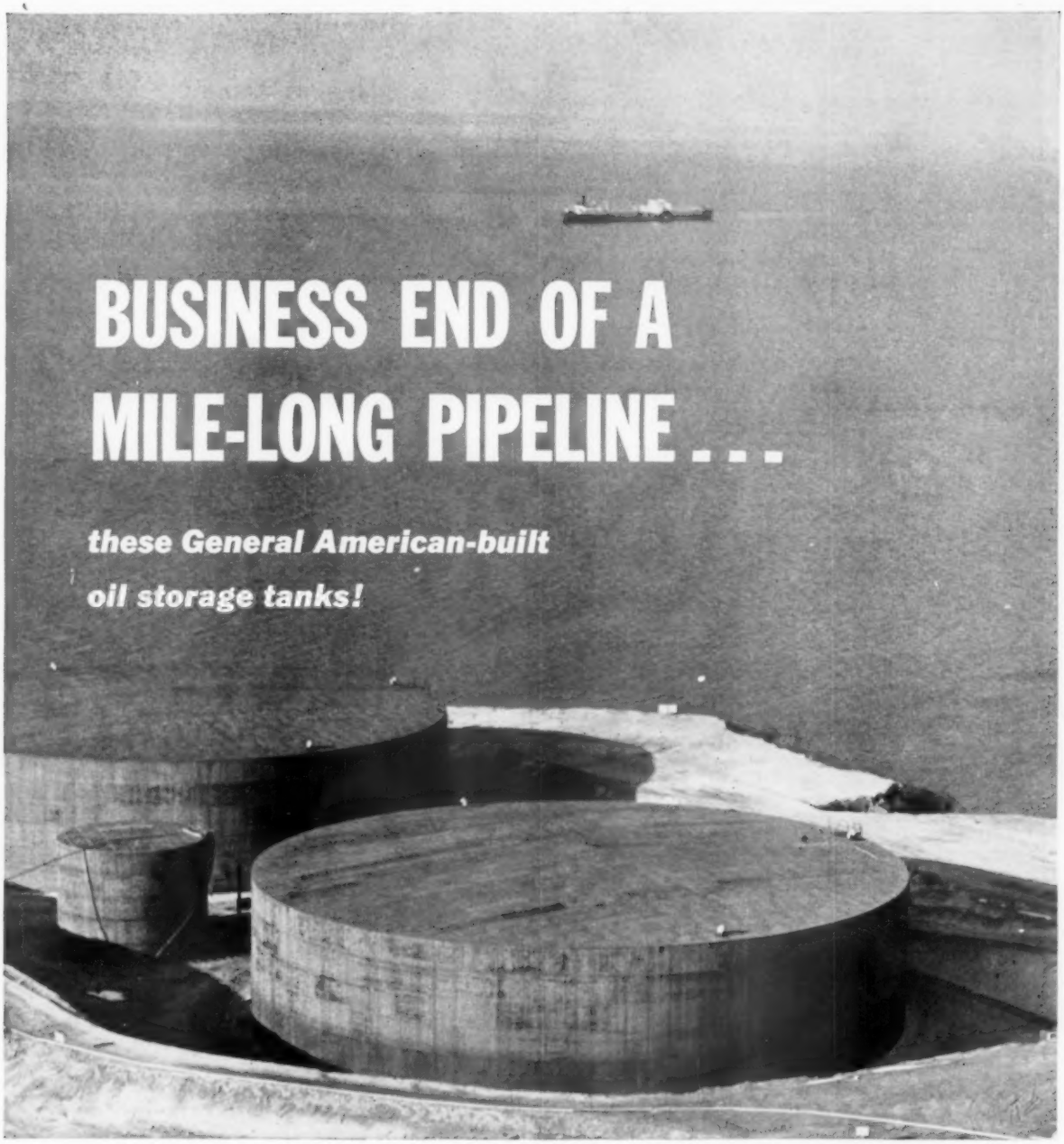
August pipeline purchases of natural gas in Texas were up 4.3% over August a year ago, according to the Texas Railroad Commission.

Pipeline gas purchases during this August totaled 344-billion cu. ft. Gas sales for carbon black and for plant and lease fuel brought Texas producers' total gas sales for the month to 393-billion cu. ft.

•

Atlantic Refining Co. will use a new nonskid deck paint on its tanker fleet.

Atlantic recently decided to use the paint after a year-long series of tests. The paint is much like other deck paints except that its abrasive material is held in suspension.



Moored more than a mile offshore in 70 feet of water, even the world's largest tankers (or any tanker presently contemplated) can deliver cargoes direct to these twin 268,000-barrel storage tanks . . . eliminate double handling and costly barging charges.

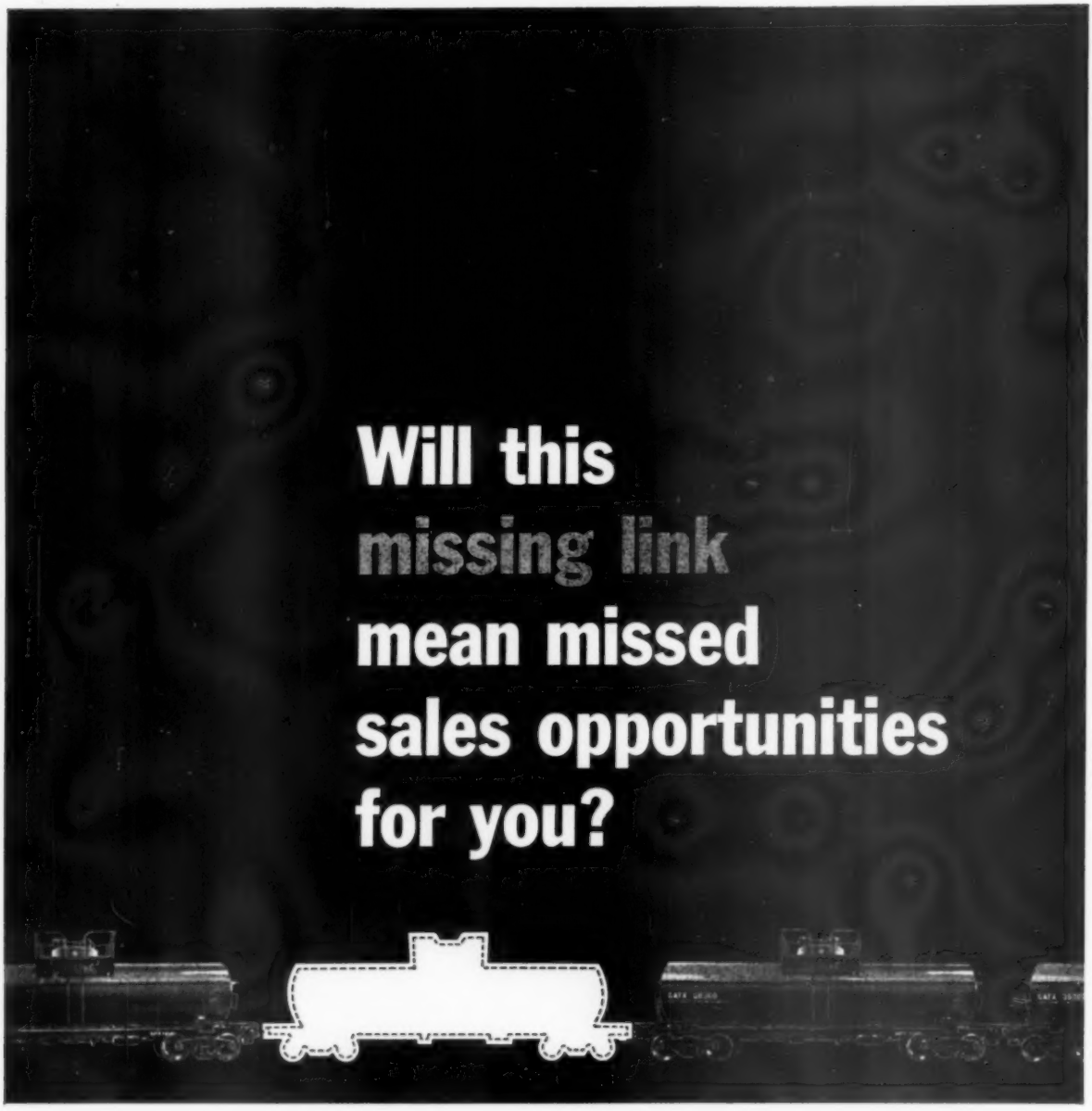
Each 200 feet in diameter, 48 feet in height, the tanks were custom-engineered, erected on the site by General American's Plate and Welding Division for Northville Dock's new Long Island Terminal. New York State's largest tanks . . . they provide storage for 22,500,000 gallons of oil.

If you need expanded storage right now, or as insurance against future demands, look into the facilities offered by General American. Whatever your storage problem—liquid or gaseous—you'll find . . . *it pays to plan with General American.*

PLATE & WELDING DIVISION
GENERAL AMERICAN

PLATE AND WELDING DIVISION
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street
Chicago 90, Illinois

STEEL PLATE FABRICATORS ASSOCIATION



You'll want every general-purpose tank car you can lay your hands on in the decade ahead. Forecasts point to booming production and sales, and a vastly increased demand for shipping facilities. But normal obsolescence affects tank cars, too. A shortage of steel, plus the time required to build, will make for scarcity. That's why alert businessmen are already examining transportation requirements—planning for tomorrow's markets . . . today.

P. S. Plan now to discuss your long-range needs with our GATX District Man. You'll find . . . it pays to plan with General American.

GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street • Chicago 90, Illinois

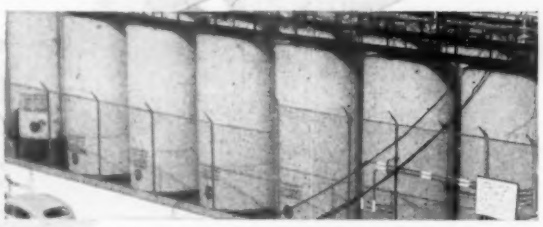
SAFE!

General American terminal keeps alcohol under "lock and key"!

Ethyl alcohol is a "problem" liquid when it comes to storage because close Federal tax supervision holds producers accountable for every gallon. A major producer who stores alcohol in General American's Carteret terminal doesn't have this problem—General American assumes it for him.

In addition to storage, the terminal provides a variety of services—metering, blending, diluting, denaturing and packaging—all provided with the necessary accountability and accuracy that solves a difficult marketing problem.

If you have a storage problem involving hard-to-handle liquids, call on General American. Leased terminal facilities give you the privacy, safety, flexibility and service of your own terminal—*without capital investment on your part.* Phone or write today. You'll find . . . *it pays to plan with General American.*



Six terminals at five key-market locations with over 14,000,000 barrels capacity: PORT OF NEW YORK (Carteret, N. J.), PORT OF NEW ORLEANS (Good Hope, La.), CHICAGO, ILLINOIS (Bedford Park), PORT OF HOUSTON (Galena Park and Pasadena, Texas), CORPUS CHRISTI, TEXAS.

TANK STORAGE TERMINALS GENERAL AMERICAN TRADE MARK

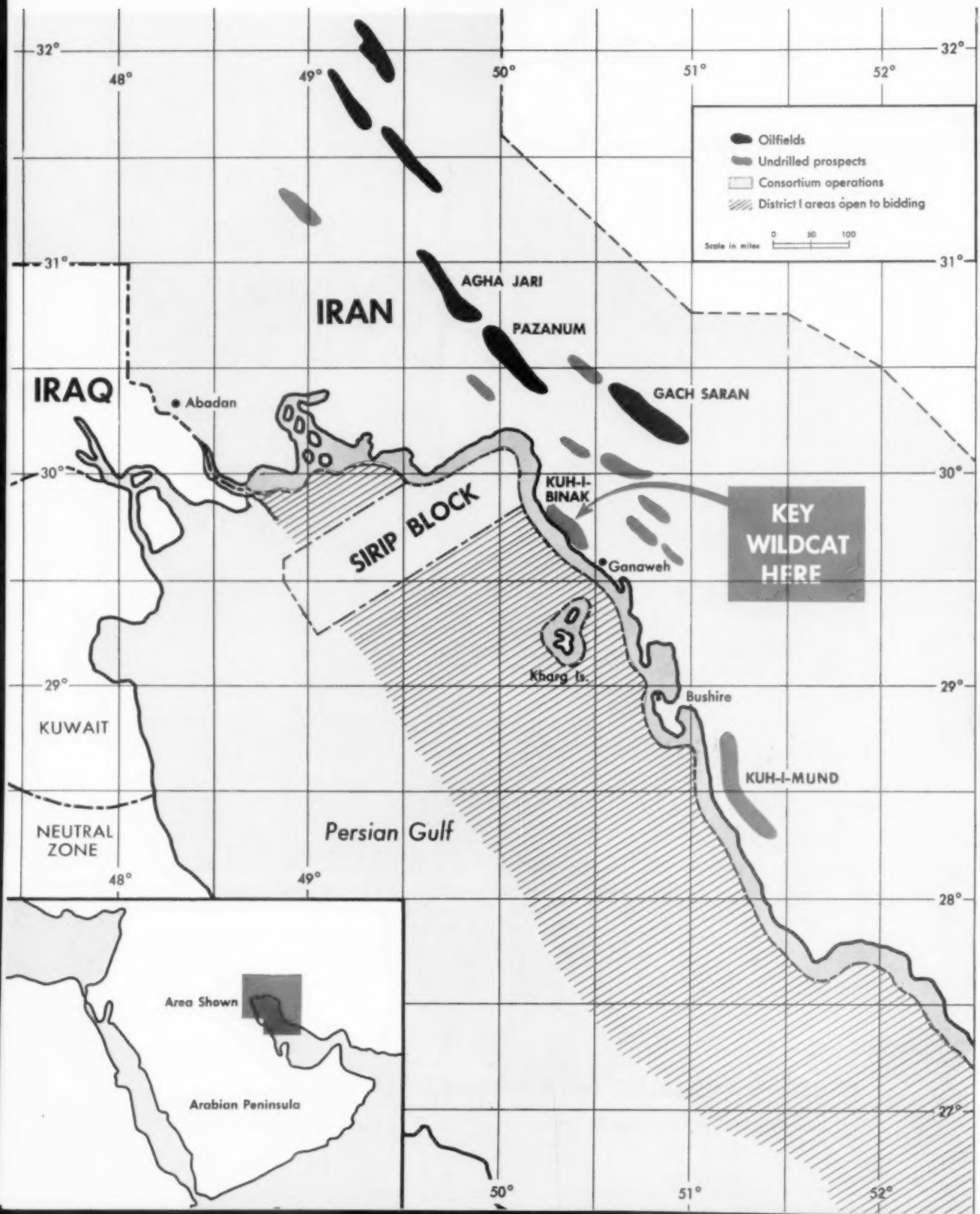
GENERAL AMERICAN TANK STORAGE TERMINALS

a division of GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street • Chicago 90, Illinois

DEPT / International

Watch Iran Wildcat: A Key to Persian G



Gulf Prospects?

Now that Iran has called for oil bids on its Persian Gulf waters, special significance is being attached to a wildcat that will be spudded shortly in Iran at the edge of the Persian Gulf. (For detailed timetable for bidding on Petroleum District 1, see PW—Nov.8'57,p38.)

The Consortium is preparing to spud the new test on the large Kuh-I-Binak structure (map). Equipment, including a rig, is already in place.

The wildcat will be the first attempt in 25 years to find oil in a coastal area. Gach Saran, the most southerly of Iran's producing fields, is 50 mi. inland.

The test area is close to the offshore block recently granted SIRIP, the Italian-Iranian company, and may provide a clue to its oil prospects.

The Kuh-I-Binak structure is one of many undrilled prospects in southern Iran, all running northwest-southeast.

The Consortium started seismic work in southern Iran last year, to the north of Bushire, near Ganaweh. By the beginning of this year, its two seismic parties were working the structures at Kuh-I-Binak and Bibi Hakimeh, to the northeast.

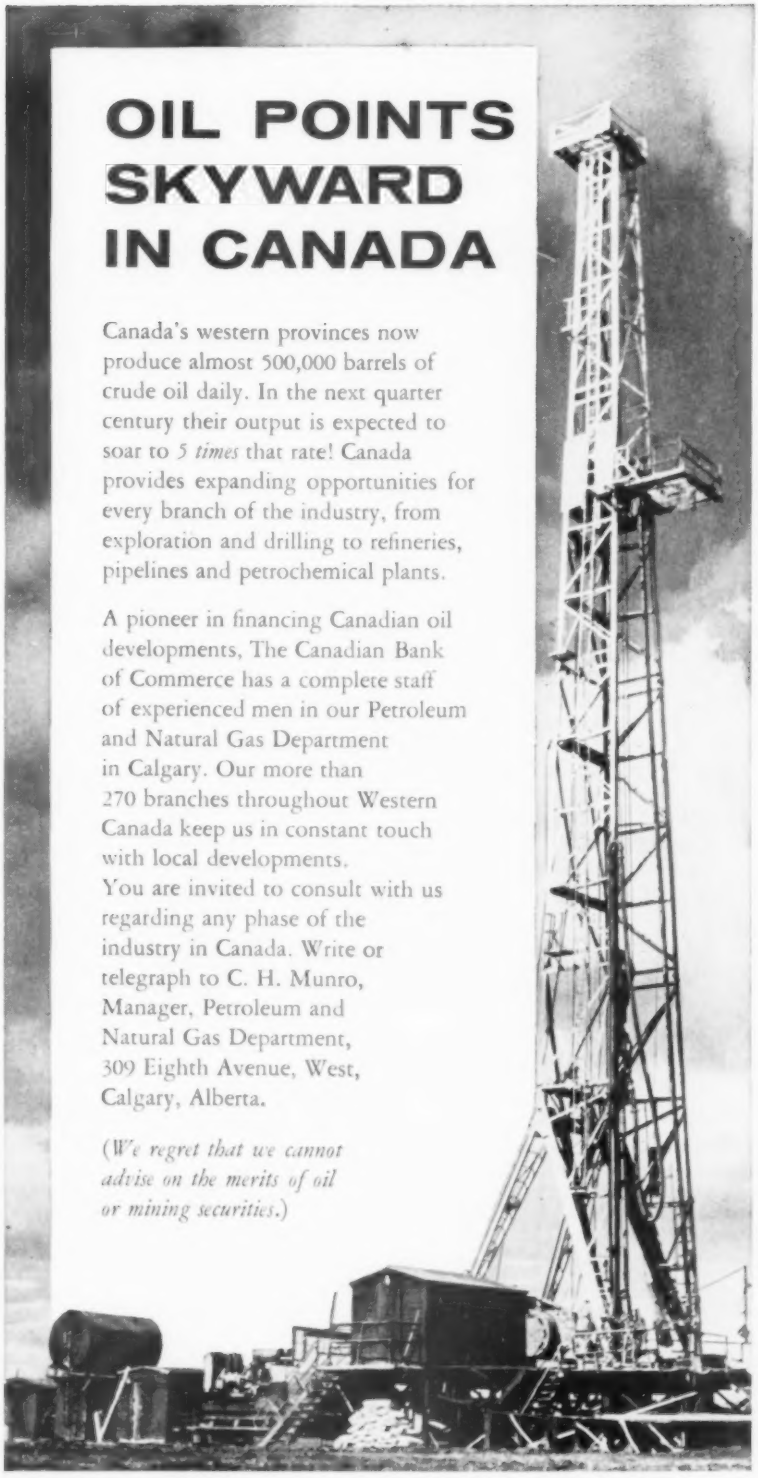
The Kuh-I-Binak structure lies in a general line between the young Gach Saran field—already Iran's third-largest—and Kharg Island, 20 mi. from the coast.

The decision to drill it is in line with the Consortium's 1958 program. This includes major development of Gach Saran by construction of a new 26-28-in. pipeline to a new deepwater offshore terminal at Kharg Island or Ganaweh (PW—Nov.1'57,p48).

The only coastal discovery ever made in Iran was a noncommercial one in 1932 at Kuh-I-Mund, a 60-mi. strip more than 100 mi. south of Gach Saran. A well was abandoned there at 3,837 ft. It found shows of very heavy 5-gravity oil in the Eocene and Cretaceous limestones, but would not flow on test.

The new wildcat, therefore, may provide the first indication as to whether Iran's big oil pools extend into Persian Gulf waters.

The first and only offshore field in the Persian Gulf so far is Arabian American Oil Co.'s Safaniya—and that's on the other side of the gulf, in Saudi Arabian waters.



OIL POINTS SKYWARD IN CANADA

Canada's western provinces now produce almost 500,000 barrels of crude oil daily. In the next quarter century their output is expected to soar to *5 times* that rate! Canada provides expanding opportunities for every branch of the industry, from exploration and drilling to refineries, pipelines and petrochemical plants.

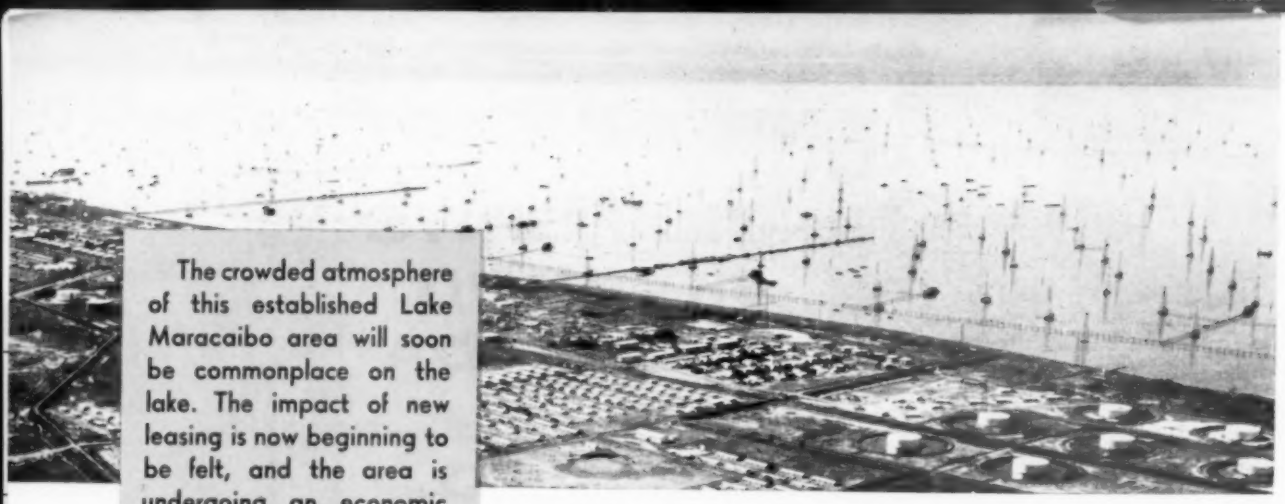
A pioneer in financing Canadian oil developments, The Canadian Bank of Commerce has a complete staff of experienced men in our Petroleum and Natural Gas Department in Calgary. Our more than 270 branches throughout Western Canada keep us in constant touch with local developments. You are invited to consult with us regarding any phase of the industry in Canada. Write or telegraph to C. H. Munro, Manager, Petroleum and Natural Gas Department, 309 Eighth Avenue, West, Calgary, Alberta.

(We regret that we cannot advise on the merits of oil or mining securities.)

THE CANADIAN BANK OF COMMERCE

Head Office Toronto 1, Canada

New York • San Francisco • Los Angeles • Seattle • Portland, Ore.
Resident Representative—Chicago and more than 765 branches across Canada



The crowded atmosphere of this established Lake Maracaibo area will soon be commonplace on the lake. The impact of new leasing is now beginning to be felt, and the area is undergoing an economic boom. Here is a roundup of what's happening:

Maracaibo: The Boom Is On

CARACAS—The first crude has started moving from new Lake Maracaibo concessions, and the area is booming.

In spite of production cutbacks, the buildup of installations and services for lake operations continues. Oil has been found on three new leases, and probably on three more.

Twenty wildcats are now spotted on 350,000 acres of underwater concessions, for which companies paid $429-million in bonuses in 1956 and 1957.

The government is feeding the boom with big public works projects, headed by a $99-million, 5½-mi. bridge across Maracaibo channel. Real estate is soaring in Maracaibo, and new buildings are sprouting.

Maracaibo, with a present population of 400,000, expects to grow into an air-conditioned metropolis of 1-million by 1985.

"Operations on the lake are strictly a blue-chip affair," one observer remarks. And oil men hasten to point out that the bustle of activity is not an oil boom, as such: The classic scramble for leases and hurried offset drilling is out of the question in Venezuela, where concessions are let by the government in big blocks.

A combination of new concessions, development drilling, the opening of the lake to deep-draft shipping, and the government's public works program are the key to the boom—a general economic expansion.

I. Big Drilling Program

Operators are laying out $150-million annually for wells in the lake alone.

The first crude from new lake leases is being shipped now by Superior Oil Co. from three wells totaling 8,500 b/d on its Group 75 concession. (The company recently completed the third, No. 7 Lama, as a 3,000 b/d producer, and is currently drilling two more tests.) For the time being, crude shipments are being made to the Las Piedras terminal of Mene Grande Oil Co., on the Paraguana peninsula.

Venezuelan Sun and Shell have also discovered oil on new acreage, while wildcats of Signal Exploration and San Jacinto have tapped promising pay zones. Creole may have found production on a midlake lease.

Other companies testing new acreage are Phillips and Mene Grande. Richmond Exploration plans two wildcats on previous lease acreage on the western side of the lake.

Creole, with 1,500 wells on the lake, programed close to 200 wells in its western division this year. Creole is developing its new Urdaneta heavy-crude field off the western lakeshore. Mene Grande laid a pipeline to its Ceuta discovery off the eastern lakeshore, and has two rigs at work there.

Southwest of Lake Maracaibo, a 2,000 b/d well was brought in recently by Colon Development Co., a Shell affiliate, at a remote spot called El Rosario, in the heart of the Motilon territory.

East of Maracaibo, on the coastal plain, Talon Petroleum has a 120-well development program under way in its El Mene field (PW—Jun.21'57, p59), and plans two deep wildcats nearby. Northwest of Maracaibo, Creole has scheduled two wildcats on new border acreage on the shore of the Gulf of Venezuela—a well-explored but untested continental shelf.

While the Maracaibo area is the first to feel the impact of new concessions, development continues at a steady pace in the eastern oil fields.

Testing is also getting under way on new concessions there. The first of several wildcats has already been spudded in the Gulf of Paria, opposite Trinidad, and tests will start soon on other leases in eastern Venezuela and Barinas.

Platforms, costing around $200,000 each, account for a big chunk of the oil industry's expenditures for lake wells.

Raymond-Brown & Root C.A., which builds all of the concrete platforms except Creole's, is setting up a new manufacturing yard for prestressed cylinder piles at El Portico, south of Maracaibo. The company is offering an island tank farm and loading platform design, consisting of a cluster of interconnected concrete platforms, to solve the problem of space on the lakeshore.

Creole casts one-piece concrete piles in a yard at La Salina. J. Ray McDermott has started installing aluminum platforms. The company recently issued over $20-million in bonds to cover expansion of construction activities in Venezuela.

II. More Contracting

Arrival of new operators in Lake Maracaibo marked a new trend: Newcomers are relying on others for services, such as construction, contract drilling, materials, marine services, and some other subsidiary activities.

Though there are only five new operators in the lake, 29 companies actually hold interests in the new leases, in a variety of combines. The companies are trying to avoid heavy outlays for equipment and installations, inventories, and organization.

This is a break with the earlier pat-

You'll find the newest oilfield supplies displayed here!

Oil Well Supply Store in Carmi, Illinois; **C. I. Buchanan,** Manager.

EACH "OILWELL" STORE handles a multitude of fine vendor products in addition to its "Oilwell"-manufactured equipment. As merchandisers, we are constantly seeking and stocking new and improved items that will serve your purposes better . . . quicker . . . cheaper. You can't see these new items over the phone . . . but you ought to know they're here in order to take advantage of them whenever they apply. Why not stop in at an "Oilwell" store regularly? If nothing else, we'd like to show you the new things while they ARE new.

OIL WELL SUPPLY

Dallas, Texas

DIVISION OF USS UNITED STATES STEEL

Mr. Oil Jobber:

THERE'S MORE GOLD IN THOSE DIGGINGS WHEN YOU SELL SUN OIL PRODUCTS

Where rugged operating conditions demand lubricants with stamina, Sun's dependable quality will build customers for you.

With construction booming—at a pace totalling more than $50 billion a year—operators are busier than ever before. They're looking for rugged, dependable lubricants to keep their equipment operating without break-down.

You can increase your share of this growing market by gearing your business to Sun's "all-purpose" line of oils and greases. For example:

Sun Solvent Refined Heavy-Duty Oils—For use in gasoline engines in severe service or in automotive diesel engines. Sun Solvent Refined Heavy-Duty Oils lengthen engine life because of their high film strength, internal cleansing characteristics and anti-acid action.

Sun Multi-Duty Grease—A premium lubricant developed for those who desire a single all-purpose grease for a variety of equipment. It is excellent for on- or off-the-highway equipment because of its all-season performance and resistance to water.

SUN OIL PRODUCTS ARE EASY TO SELL

For detailed information, prices, delivery data and sales aids, write to Department PW-11.

GENERAL WHOLESALE DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

© SUN OIL CO.

In Canada: SUN OIL COMPANY LIMITED, Toronto and Montreal

tern established by Creole and Shell, which were, of necessity, self-sufficient in many respects.

Of 21 new tenders put on the lake during the past year, 12 are owned, and another operated, by contract drillers. Loffland Bros. brought in five; Perforaciones Delta, four; Kermac Drilling, two; and The Offshore Co., one. Loffland is also operating a barge owned by Superior Oil.

Offshore Co. has another barge enroute, and an operating company reportedly will bring in three more. Creole purchased six tenders—partly to replace retired steam barges—and Shell two.

III. More Rigs Active

Average number of rigs drilling new hole in Venezuela is currently around 120, compared to 94 early in 1956. The Maracaibo area accounts for 65% of the increase. Some 40 workover and service rigs are operating.

Well completions in the Maracaibo district last year totaled 731. The total will be greater this year.

Initial wells of newcomers on the lake cost an average of around $1-million, including contract drilling at about $4,000 a day.

Practically every major U.S. drilling contractor has looked over possibilities in Venezuela during the past six months. But only a few have moved in rigs.

Kermac and Offshore Co. are new on the lake. Falcon Seaboard Drilling Co., of Tulsa, bought out D & D Drilling Co., in eastern Venezuela, while Helmerich & Payne, of Tulsa, took over Sinclair's drilling operation. Reading & Bates, of Tulsa, will drill the first wildcat for Venezuelan Atlantic Refining Co. on the new Block 11 lease in Barinas.

Gulf Coast Drilling & Exploration Co. has incorporated in Venezuela. And Rimrock Tidelands, Inc., of New Orleans, reportedly plans to move in.

IV. Supply, Service Trends

The supply business—with annual dollar volume now in the tens of millions—doubled in Venezuela during the past year, and may double again next year.

Continental Emsco and National Supply are both building new stores at Maracaibo, and have expanded at Las Morochas, on the eastern lakeshore, as well as in eastern Venezuela. The former is offering quick deliveries of "off-the-shelf" barges for Maracaibo operations.

Cardwell Mfg. Co., of Wichita, Kan., has set up a Venezuelan subsidiary. And Houston Oilfield Material Co., Inc. (HOMCO) set up a new operation in the Maracaibo area about a month ago. The company has directional drilling, and fishing and cutting operations.

Maracaibo operators formerly built up huge inventories of supplies in their own warehouses—Creole has a $20-million stock at La Salina alone. Supply companies had stocked only emergency items. Now they're stocking capital equipment and the whole range of day-to-day company needs.

Service companies, with operations geared to major company drilling programs, foresee only a normal increase of around 10% in activity next year. Their operations expanded 17% when development drilling spurted during the Suez crisis.

Schlumberger is adding to its Las Morochas installations, and Petro-Tech plans facilities farther south on the lake, at San Timoteo, opposite new concessions. Halliburton has added two barges, two tugs, and a crew boat to its fleet, with two tugs and two barges on order. Servicios Hydrocarb is adding two barges.

Baritina de Venezuela and Magcobar de Venezuela have both set up million-dollar plants for grinding mud additives at Punta Camacho, on the lake, as well as at Puerto La Cruz in eastern Venezuela. United Oilwell already has acid plants in Venezuela; plant plans of other service companies are in an early stage.

Geophysical exploration, which hit a peak in late 1956, is expected to pick up again next year after companies have looked over results of present wildcat drilling.

Exploration is currently at low ebb on the lake, with only one seismic and one gravity party out. Seismic exploration is seasonal, since the lake is closed to shooting during the fish-spawning season from January through July.

There now are nine U.S. geophysical companies established on a permanent basis in Venezuela. General Geophysical, Robert H. Ray, and Gravity Meter Exploration are newcomers; Rogers Explorations, Offshore Explorations Group, and Western Geophysical set up in 1955.

New concessions have brought increased demand for marine transport services. But expansion of these services has apparently outrun demand.

Independent fleet operators have added equipment ranging from crew launches and service boats to tugs and oil barges. One company brought in around 30 barges, and has over half of them standing idle.

Levingston Shipbuilding Co. of Orange, Tex., is starting construction on a $1.8-million drydock and shipyard on the western shore of Lake Maracaibo.

Marine operations on Lake Maracaibo are unique in the oil business. Equipment is generally lighter than that used on the U.S. Gulf Coast, heavier than inland waterways craft. Much of it is designed especially for the lake.

Newest wrinkle is a high-speed hydrofoil launch of European make, being tried out by Shell. Foils lift the hull completely out of the water at cruising speed.

An innovation in lake transport and marine service is Terminales Maracaibo, which will furnish terminal and equipment facilities for many "owner" companies.

The $24-million local company was set up with support of oil and service companies for lake operations, to eliminate their need to build separate bases (PW—Jun.14'57,p71).

Dredging and construction are under way at its Las Morochas base. It is negotiating for land at San Timoteo for a second base nearer new lake leases.

The firm bought out Maracaibo Towing Co.—the lake's biggest independent fleet operator—and will provide some transport services on a joint basis. Deliveries will start next month on initial purchases of new equipment.

Companies that will use the base include Halliburton, United Oilwell Service, Servicios Hydrocarb, Signal Exploration, San Jacinto, and others —among them, probably Westinghouse Electric and Martin Engineering Co., a Maracaibo construction firm. Halliburton will set up cement silos on the dock. Schlumberger occupies adjoining land and will use the terminal.

Westinghouse has tentatively located a maintenance and repair shop for heavy equipment at the base.

V. Communications Expand

Communications, a $2-million business, is one of the oil industry's liveliest "fringe" activities in the Maracaibo area.

An estimated 2,000 high-frequency channels are licensed around the lake —one of the world's biggest concentrations of radio communications. Because of a telephone shortage, companies use high-frequency radio between offices and operations, as well as for contact with lake craft and other mobile units. Available VHF channels are nearly all occupied, and companies

Oil Well Drilling Equipment

rock bits · tool joints
boilers · chain · brake blocks
derricks · tanks

LUCEY

pumps
liners · valves
totco drift and directional recorders
tubular goods · wire rope
tuffy slings

LUCEY
EXPORT CORPORATION
233 BROADWAY, NEW YORK 7, N. Y.
pretecca, urbanizacion sucre, maracaibo, venezuela
calle defensa 320, buenos aires, argentina
broad street house, london e.c.2, england
rua do carmo, 27-7°, rio de janeiro, brazil
calgary and edmonton, alberta, canada
west building, houston, texas

Men on the Move

Now available in a *new edition* . . . with *new figures.*

This popular booklet points up the important sales problem of personnel turnover in industry. Out of every 1,000 key men (over a 12-month period) 343 new faces appear . . . 65 change titles . . . 157 shift . . . and 435 stay put. These figures are based on average mailing address changes on a list of over a million paid subscribers to McGraw-Hill magazines.

Write us for a free copy

Company Promotion Department
McGraw-Hill Publishing Co., Inc.
330 West 42nd Street,
New York 36, New York

are turning to microwave systems. Volume of installations has increased four-fold this year.

International Offshore Navigation Co. operates a ring of stations on mountains in the area to provide directional fixes on locations of exploration parties.

Shell is setting up the first "over-the-horizon" forward-scatter microwave system in South America, for communications between Maracaibo and its Amuay refinery.

Creole is stringing three 250-ft. transmitter towers along the eastern lakeshore, with a 440-ft. receiver tower inland, for multichannel microwave communications.

VI. Big Construction Boom

Next to oil production, construction is the biggest business in and around Lake Maracaibo. Terminal construction is booming.

Deep-water loading terminals on the lake—made possible by a channel opened last year through Maracaibo bar—are at the top of the oil company list of about $200-million for major projects.

Shell will spend $84-million on a 700,000 b/d terminal, to be called Puerto Miranda, at the entrance to the lake northeast of Maracaibo. Mene Grande Oil Co. may share costs of the terminal, which will take two years to complete.

Shell is promoting participation of other companies in a unified pipeline system the full length of producing areas along the eastern lakeshore.

Facilities at the Shell terminal will include two docks, with seven berths for big tankers, and 23 storage tanks of 170,000 bbl. each.

Creole has completed a 125-acre sheet-pile enclosure for a $24-million island terminal a mile offshore from La Salina. Two 1,100 x 80-ft. loading piers have been built. The project calls for initial loading capacity of 350,000 b/d, with design capacity of 1¼-million b/d. Eventual storage capacity will be 12-million bbl.

Superior is completing a $4-million terminal with 1,000-ft. pier at San Francisco, on the western lakeshore. It is also building three tanks with a combined capacity of 190,000 bbl. at Talon's La Estacada terminal.

Richmond is expanding its platform terminal in the lake. Signal Exploration and Sun are studying plans for a terminal south of San Francisco. Other terminals on the lake have been dredged to greater depths. And Creole and Shell are each adding a fourth pier at their Amuay and Cardon terminals.

Other big oil industry construction projects are Creole's Tia Juana 3 gas injection plant, costing over $40-million, and a fourth plant in the Bachaquero area.

Refinery installations are being expanded, too.

Shell recently completed a $42-million, 35,000 b/d fluid catalytic cracking and an alkylation unit at Cardon, and is adding a fourth crude unit of 80,000 b/d capacity.

Creole last month completed a 104,000 b/d crude unit at Amuay, and is building a lube plant and an LPG plant. Richmond has expanded its Bajo Grande plant to 30,000 b/d.

Creole is going into the housing business on a major scale—in order to get out of it, eventually. The company is setting up integrated communities at Amuay and at Tamare, near Tia Juana. Houses are sold to employees and all comers, with the aim of abolishing company-owned camps. An initial 250 houses of a total of 1,600 are now under construction at the $9-million Tamare development.

Major new construction—under way or planned—easily totals 400-million in the Maracaibo area, with government projects accounting for half.

There is a substantial buildup in industrial plants, including an $18-million private power utility expansion in Maracaibo. International Power Co. will boost generating capacity by 155,000 kw. And the government is increasing capacity at two of its plants.

In Maracaibo city, enthusiasm has been fired by the government's spectacular bridge project. Real estate is booming. The city is getting a system of belt-line speedways, a new international airport, and South America's biggest hospital.

The bridge across Maracaibo channel features the world's longest prestressed-concrete span. It is slated for completion in 1960.

A new port will be built at Palmarito, on the lake's southern shore, to handle 3-million tons of cargo annually. The ship channel will be deepened further.

Beyond Palmarito, near the Barinas fields of Socony and Sinclair, a pair of big dams will be built.

All this activity is concentrated in one of the world's great oil producing areas—a region of less than a million inhabitants, bordered by a piece of territory where the Motilon Indians are still holding off civilization at arrow-point.

What's New / AROUND THE WORLD

Sahara Interest Spreads

ALGERIA—International competition for Sahara oil rights is growing. Texas Eastern Transmission Corp. is the latest U. S. company to start negotiations, while German, Belgian, and Canadian companies also are reported interested.

Texas Eastern is now having discussions with possible French partners. It is interested in gas production and pipeline construction, as well as oil exploration. It will probably invite one or two large U. S. companies to participate as its plans develop.

This was disclosed in Paris last week by consulting geologist H. S. Bennett, who is representing Texas Eastern.

He said the company may file an application before the Dec. 2 dead line on the 14,000 sq. mi. area that becomes available in January (PW—Nov.8'57,p39). Otherwise, it may apply for other acreage later. Another 8,000 sq. mi. will be due for redistribution around March, and a further 55,000 sq. mi. around May.

Bennett said Texas Eastern is also interested in other French African territories, such as Mauretania, Senegal, and Gabon, as well as North African countries in general.

•

Tapline Capacity Grows

LEBANON—The 28% expansion in capacity of the trans-Arabian pipeline system from Saudi Arabia to the Mediterranean is nearing completion. By the end of the year, capacity will be 435,000 b/d, as compared with its original 340,000 b/d.

The expansion is already making its impact, pushing Trans-Arabian Pipe Line Co.'s crude deliveries to a new record of 394,367 b/d in October.

By the end of the year, a total of eight new turbine pumping units will be installed on the whole pipeline system.

Six of the new units were in operation for all or part of October. Two of these are portable units installed on vans within Saudi Arabia on the Arabian American Oil Co. system, from which Tapline picks up. The other four are on the Tapline system itself: three are portable units within Saudi Arabia; the fourth is a permanent installation at Qaryatain, Jordan —the first ever set up outside of Saudi Arabia.

Two more units remain to be installed permanently, at the existing pumping station at Turaif in Saudi Arabia. A ninth pump ordered for the expansion program will be reserved as a spare portable unit.

•

Mideast Output Steady

Middle East crude output held at near-record levels again in September, with a total of 3,847,000 b/d from key producing states. The total was 30,000 b/d below July's all-time record, but 5,000 b/d over August, and 240,000 b/d over September, 1956.

Iran set another record, which was offset by a 100,000 b/d drop in Saudi Arabia. Kuwait production remained virtually constant; Qatar picked up after falling somewhat last month; and Iraq's still-crippled oil flow continued to climb.

Here are the totals, in 000 b/d:

	Sept. '57	Sept. '56	Aug. '57
Kuwait	1,283.6	1,123.6	1,292.4
S. Arabia	1,055.0	1,047.9	1,152.1
Iran	766.0	577.0	763.0
Iraq	586.9	735.3	487.6
Qatar	156.4	123.5	147.7
Total	3,847.9	3,607.3	3,842.8
9-mo. avg.	3,334.4	3,580.2	

•

IRAQ—Iraq reportedly gave a cool reception to the "Pan Arab pipeline company" proposal put fourth by Saudi Arabia at the Arab League Oil Experts Committee meeting in Baghdad (PW—Nov8'57,p11).

Iraq made it clear, however, that it would not oppose pipelines crossing Iraqi territory if other Arab states should decide to go ahead with the project.

As proposed by Saudi Arabia's oil director, Abdullah Tariki, it calls for a new pipeline system from the Persian Gulf to the Mediterranean, to be financed by Arab governments.

"Several recommendations" finally agreed upon by the group will be sent for approval to the Arab League Economic Council meeting in Cairo Dec. 5. Exactly what is included was not mentioned in an official communique issued last week as the meetings ended —one week ahead of schedule.

A plan aimed at unifying the policies of producing countries toward oil companies was agreed upon by the oil committee. This also will go to the Economic Council.

The usual unanimous agreement was reached on strengthening the oil blockade of Israel by persuading "friendly" countries (such as Iran and Italy) not to supply Israel.

The oil committee also finally agreed on Cairo as the location for the Pan Arab Oil Congress next February. Iraq originally held out for the meeting to be held in an oil producing country (PW—Sep.6'57, p44).

•

LIBYA—Esso Standard (Libya) is now drilling a second test in the Fezzan, about 100 mi. east of the Edjele oil field, across the border in Algeria.

The first test was abandoned at Al Auenant, about 75 mi. southeast of Edjele, as "unsuccessful." It reportedly found oil shows at 1,117 ft. (PW —Aug.9'57, p46).

•

EGYPT—The government's hopes for the Abu Rodeis discovery on the Sinai coast have been boosted by a stepout well.

Minister of Industry Aziz Sedki announced last week that the well flowed at the rate of 120 bbl. per hour on initial test at 8,376-840 ft. The well, No. 3 Abu Rodeis, is 240 ft. from the No. 1 discovery well.

The find is on the west coast of Sinai, across the Gulf of Suez from Ras Gharib field. It was brought in by Eastern Petroleum Co., which was set up as a development company to take over the operations of International Egyptian Oil Co., and its Belayim and Feiran fields on Sinai (PW —Jun.21'57,p58). It is owned 49% by the Egyptians, and 51% by Petrofina and the Italian government's AGIP Mineraria.

•

INDIA—Rumanian drillers claim "material evidence of oil" in a wildcat now being drilled for the government in East Punjab near the ancient temple of Jwalamukhi.

The test, now below 4,000 ft., has reportedly had a series of oil traces. It is the first to be drilled for the government's own exploration program under a contract agreement with the Soviet bloc for equipment, technicians, and service.

DEPT/Management

Do Engineers Gain from Fellowships?

YES . . .

according to a survey of 92 men helped by Ethyl Corp. to complete graduate research studies in chemistry, petroleum engineering, and other technical fields.

Years later, the 'typical' recipient says . . .

- His career (including salary) was advanced by the graduate study.
- He has job satisfaction, and has been with the same employer since finishing graduate work.
- He approves the sponsoring company's hands-off policy toward fellowship awards—yet he would have liked more contact with the company while studying.
- He sees some danger that students are getting an "industry owes me a schooling" attitude.
- He feels fellowships are a worthwhile form of aid to education.

Ethyl Corp. last week came up with the first concrete answer to those who wonder how much value there is in company sponsorship of college graduate study by technical students. The answer, based on a depth-survey of former students themselves: The fellowships do a lot of good.

Until now, companies such as Socony-Mobil, Standard of Ohio, Shell, California Standard, Ohio Oil, Indiana Standard, and others have lacked any real measure of the value of their fellowship programs, either to the student or to the company. The question is an important one, since millions of dollars have gone to college graduates in the form of financial aid that will permit the students to add to their knowledge and technical skill, while working toward master's or doctor's degrees. Such aid is an important part of programs to combat the shortage of highly trained engineers and scientists.

Ethyl held personal interviews with 92 men who had studied under company fellowships from 1937 through the 1953-1954 academic year. Fifteen of these men did their graduate research in petroleum engineering, although the greatest concentration (43) was in chemistry.

Other fields of study were chemical engineering, mechanical engineering, and physics. The graduate work was done at 27 colleges and universities from coast to coast.

Ethyl contacted men who completed their studies before 1955 because it felt more recent graduates would not be able "to evaluate their fellowships in terms of career advancement."

A quarter of the former students now work for 13 different oil companies, in both management and research positions. Largest single employers among oil companies are Shell Development, with five men, and Continental Oil, with three. Five more men are in the Indiana Standard family. Six are with Ethyl Corp. itself.

Of the rest, 39 work for companies outside the oil industry, 16 are with colleges (mostly as faculty members), and the others work for the U.S. or Canadian government.

Here's what the men, looking back, told Ethyl interviewers in the survey released last week:

A total of 81 of the 92 are convinced they are further ahead in their careers than if they had not gone to graduate school. Five others feel they will advance further eventually. Only six say their progress has not been helped.

Most think that graduate degrees brought them a higher starting salary, or present salary, and that they would not hold their current positions without graduate training. Some men like the prestige of a higher degree, plus the chance to do work that only graduate study permits.

About two-fifths are in supervision. Ethyl calls this "extremely satisfactory," in view of the fact that more than half of the 92 had completed graduate study within five years of the survey period.

Evidence that both the men surveyed and their employers are satisfied is the finding that two-thirds (62 of the 92) have been with the same organization ever since completing graduate work.

A full three-fourths of the recipients see the fellowship as worth more than its dollar value. Many go so far as to call the dollar value secondary.

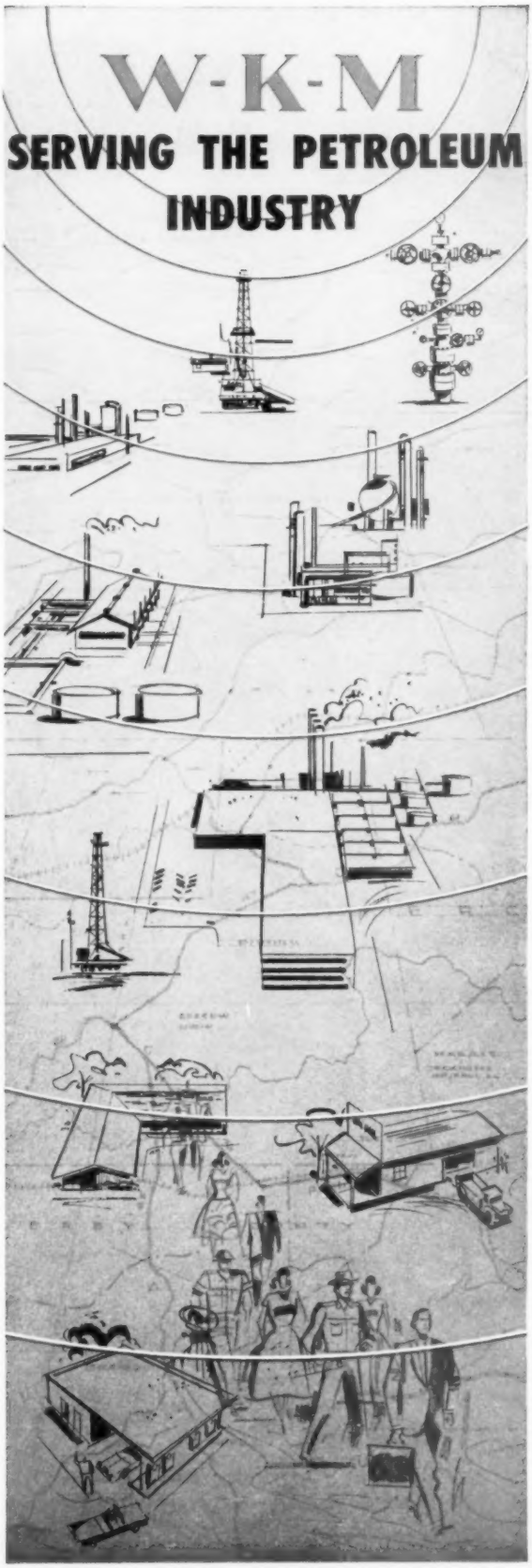
Mentioned most often among some two-dozen advantages is the fact that the fellowship (1) Increases the chance to do more and better work in graduate study, (2) provides prestige on the campus, plus help in getting a good job later, and (3) enables the student to get his degree sooner.

Almost all the men interviewed agree that industrial fellowships are a worthwhile form of aid to education. Among the reasons given are these:

- Fellowships give industry and the universities a chance to exchange views.
- They give the student a sense of pride and personal responsibility.
- They leave the student free to follow the course of research he desires.
- They can offer a valuable association with a large company.
- They are evidence of the sponsoring company's "enlightened policy."

Two former students, however, feel that fellowships have backfired, or might, because they tend to create "spoon fed" young men.

"Graduate students don't know what it is to work for themselves,"



...From Rig to Retail

W-K-M products serve the petroleum industry every step of the way — they control and direct the flow of petroleum more efficiently, more economically, at the well; in the field; in refineries, processing and recycling plants; all along the pipelines; in compressor and pumping stations; and in distribution systems for homes, industries and even the corner filling station.

Whatever the phase of the industry you are in, you will find a W-K-M product to meet your requirements. Write W-K-M for further information to help you select the products that apply to your operation.

W-K-M® Through-Conduit Gate Valves for oil field service 2" to 4", 500 psi to 15,000 psi working pressures.

W-K-M Process Valves 2" to 30", ASA 300 lbs., 400 lbs., 600 lbs., 900 lbs., 1500 lbs.

W-K-M ASA Through-Conduit Gate Valves 2" to 30", ASA 300 lbs., 400 lbs., 600 lbs.. 900 lbs., 1500 lbs.

acf® Lubricated Plug Valves with round and rectangular ports ½" to 30", 125 lbs. to 500 lbs. working pressures WOG.

acf Ball Valves ½" to 6", 150 lbs. to 400 lbs. working pressures WOG.

W-K-M Tubing Slips and Spiders for strings ¾" to 3" O.D. and depths to 15,000 feet.

KEY® Return Bends.
Available in complete range of sizes, shapes, styles, temperature and pressure ratings.

KEY-KAST Alloy Steel Welding Fittings in tees, wyes, elbows, laterals, reducers, as well as special shapes.

KEY-TITE Waterproof Pipe Joint Compound for lines carrying water, gas, low-pressure steam.
KEY Graphite Paste for lines carrying oil, gas, high-pressure steam.

5718

W-K-M
DIVISION OF acf INDUSTRIES INCORPORATED

PLANT: MISSOURI CITY, TEXAS
MAILING ADDRESS: P. O. BOX 2117, HOUSTON, TEXAS

W-K-M, acf, KEY ARE REGISTERED TRADEMARKS OF acf INDUSTRIES, INCORPORATED

Why Engineers Choose a Job

(Leading reasons and percentage of mentions by engineers and scientists surveyed by Ethyl Corp.)

Job location	40%
Type of research I wanted	20%
Previous association with the company	13%
Salary	9%
My professor influenced my decision, or got the job for me	6%
Had friends with the company, or personally knew some of the people I'd be working with	6%
Knew job I'd be doing	6%

says a 1940-1941 fellowship recipient. "They have financial aid thrust upon them."

Adds the other critic, who had a 1952-1953 fellowship, "Care should be taken by industry not to overstock schools with fellowships, and thus make colleges an obligated arm of industry. Another danger is in forming a student attitude that 'industry owes me a schooling.'"

Those surveyed are split on whether the sponsoring company should concern itself with the award and administration of fellowships. Almost all approve of Ethyl Corp.'s system of letting the student's professor or department head handle the matter. But many of the same men say they wish Ethyl had shown more direct interest in them and their university work.

Sample comment of those favoring company participation:

"I wonder what's in it for a company when it doesn't tie in recruiting with its fellowships."

"The company should make sure the students' research projects are of direct interest to the company."

Those voicing disapproval of company participation put it this way:

"If a company dictates the fellow's project, it is requesting research the company should be willing to pay for directly."

"Industry must give universities freedom to develop basic research that may not have any immediate practical application."

"All contacts about the fellowship should be between the professor and the student. No one from the sponsoring company should be in, or get into, the picture at all."

One-seventh of Ethyl's fellowship winners say they had "some feeling of obligation" to the company, despite the fact that almost all understood no obligation was necessary.

This feeling ranged from considering Ethyl "first and exclusively" for employment after graduation to acknowledging the company's help in the graduate thesis.

The principal factors actually influencing job choice are shown in the table (left). (One reason for the "low" emphasis on salary, in this and other surveys, is the students' recognition that salaries offered by different companies are roughly comparable.)

Four-fifths of the men Ethyl helped were in definite need of outside financial aid. In some cases, the student would have had to drop out of school without the fellowship. In other cases, the student would not have gone on to graduate work unless he had the assurance of fellowship aid.

One-fifth of those surveyed had saved enough money for graduate work, or could have been financed by their families.

About half of those interviewed were supported by Ethyl in the final year of doctorate work. In 30 cases, the support was in the final year of study for a master's degree. And 15 were supported by Ethyl fellowships throughout their graduate study.

In making industry's first comprehensive survey of the reaction to fellowships, two Ethyl representatives interviewed each of the 92 men for one to three hours. Thom Yates and Harry McGraugh, of Ethyl's public relations department in New York, traveled 45,000 mi. through 23 states and Canada. They spent more than 200 hours in interviewing, plus 350 hours in writing up each interview and preparing a summary report.

Many of the men had to be caught on the run—in railroad stations, airport terminals, coffee shops, and hotel lobbies. Appointments were kept as early as 6:30 a.m. and as late as midnight.

Home-Study Holding Its Own

Largely hidden by today's extensive in-plant training programs of oil companies, the correspondence course is still finding use as a helpful tool to fill in training gaps. This is apparent from statistics released this week by International Correspondence Schools, of Scranton, Pa. (largest mail-study school, and the one offering the most oil courses).

ICS figures show that at least 2,500 employees of oil companies have taken ICS petroleum courses in the past five years. Subjects include petroleum technology, petroleum production, natural gas production and transmission, petroleum refining, and others.

The figure of 2,500 is conservative, since it excludes (1) students with oil companies that have no ICS contract, and (2) students who enroll on their own, even though their companies do have contracts. Also not counted are students who take courses "related to" oil operations, or who study at correspondence schools other than ICS.

An analysis by International Correspondence Schools of enrollments from 1952 through the first six months of 1957 shows "a considerable upward trend" in mail courses in oil field subjects.

Says an ICS spokesman, "Enrollments parallel industry conditions in almost exact percentages. If there is an increase in employment, or if improved technology demands new training, an increase in enrollments results."

ICS today has training arrangements with many big and small oil companies. The firm has on its list Ashland, Atlantic, Cities Service, Continental, Esso Standard, Gulf, Humble, Phillips, Pure, Richfield, Socony-Mobil, Shell, Skelly, Sun, Tidewater, Union Oil, and others.

Some of the oil companies have a blanket arrangement for all operational units, others only for specific units. Still others allow each company unit to contract on its own.

An agreement between one major and ICS covers more than 5,000 employees in field locations in California, Wyoming, Montana, Texas, Louisiana, Indiana, Illinois, and Ohio.

Personnel men with oil companies stress that correspondence courses are not a substitute for a direct training effort—but a means of meeting special local needs. An industrial relations executive with an Eastern major says, "A lot of people start mail courses and never finish them. What a man gets out of them depends on his purpose and background. It's a mistake to think you've done your training job by making the courses available."

ICS says oil companies are using

• *In the oil world Houston is* **FIRST CITY**

• *With oil men Houston's* **FIRST CITY** *National is first*

• Make friends now at the oil man's bank—
where you'll find officers with a practical
knowledge of your requirements.

FIRST CITY

NATIONAL **BANK** OF HOUSTON

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

its courses to meet these objectives:

- Apprentice training to develop such craftsmen as electricians, field machinists, instrument technicians, pipefitters, and welders.
- Upgrading of workers in all classifications.
- Training an individual to do a specific job requiring new skills.
- Training foremen in supervisory techniques.

Management of a major-company refinery has used correspondence courses to upgrade almost all of its skilled maintenance force.

After extensive study, company training men isolated seven general categories of jobs and skills to be considered for training.

Company and ICS officials then developed courses (using ICS materials) to meet the training need of each category. They also worked out a basic course in order to provide the mathematics and craft skills that were common to all categories.

ICS also developed a battery of diagnostic tests to measure each worker's skills in the individual categories of his job. The worker was then trained only to correct apparent weaknesses.

Offshore
OIL INSURANCE
—Loss prevention service included!

YOUR INSURANCE AGENT or broker knows the importance of experienced handling in arranging proper coverage, and he knows how much proper servicing of losses can mean to you. For this reason he will probably recommend placing the insurance on your offshore oil drilling and production equipment with a specialized market such as Southern Marine.

Important too, our Loss Prevention Service (included at no extra cost) is geared to work with you in preventing loss to (1) reduce future insurance costs and (2) prevent equipment down-time. Even with full reimbursement for loss or damage, equipment down-time for repairs knocks out your income. Ask those who use our Loss Prevention Service how well it works.

SOUTHERN
MARINE & AVIATION UNDERWRITERS, INC.
NEW ORLEANS

610 Poydras Street Telephone TUlane 5266

L. K. GIFFIN, President; LEE M. STENTZ, FRED L. KRIEDT, Vice Presidents

What's New
IN MANAGEMENT

Oil management has got more than its money's worth from its $7-million investment in API research—especially in oil recovery and refining—according to a report at the API meeting in Chicago this week. Reviewing 31 years of progress by the API Fundamental Research Program, Shell Oil's Monroe Spaght (vice-chairman of the API Research Committee) listed such benefits as these:

- API research on wettability has thrown light on extremely complex problems involving the behavior of oil, water, and sand in producing formations.
- Work in geophysics has helped develop better methods of mapping subsurface structures of the earth.
- API studies at California Institute of Technology produced books of highly useful data on the properties of hydrocarbons and their mixtures. Oil-company scientists developed this data into gas-injection techniques that have made possible the recovery of 1.7-billion bbl. of oil.
- Hydrocarbon antiknock data provided by API research is used in judging new processes for improving gasoline octane.
- Oil scientists calibrate their physical instruments with pure reference materials from API research.

"It is no overstatement to say," said Spaght, "that alkylation, isomerization, and dehydrocyclization would not have come into your vocabulary as refinery processes if we had not had available the basic data on hydrocarbons to allow us to design the necessary process equipment."

•

"The best way to find out if a man can do a job," says a top oil executive in the Southwest, "is to make him take the pressure of handling it."

Commenting on his department's system of rotating candidates for promotion through the job to be filled the executive says, "Some men insist they want the extra responsibility. But they don't hold up well under it. Until you actually see a man on the job, you're really only guessing about his ability."

The executive adds, "Trying men out for the same job does have the disadvantage that the losers feel they are not well equipped, when in fact they may be highly capable. This is hard on morale. But there is the advantage that everyone feels he has a chance, and the men really hustle."

This O-C-T branch warehouse in the Midland-Odessa area is typical of the kind of facilities O-C-T has provided to assure you good field service.

SERVICE UNLIMITED

OIL CENTER TOOL COMPANY
WAREHOUSE AND SERVICE POINTS

Corpus Christi, Texas	Natchez, Miss.
Dallas, Texas	Farmington, N. M.
Houston, Texas	Hobbs, N. M.
McAllen, Texas	Williston, N. D.
Midland, Texas	Oklahoma City, Okla.
Odessa, Texas	Casper, Wyo.

During the drilling and completion operations on every well, there comes a time when good service from your equipment supplier can save you money.

O-C-T has earned its reputation for good service by dependable performance in the field year after year.

We can only guess how many thou- sands of dollars have been saved for by prompt O-C-T know this: Oil Center naintains the largest on in the field to help e wellhead assemblies. d combination you can ost dependable equip- st service in the field.

NEW SUBSCRIPTION ORDER CARD

Send me a year of PETROLEUM WEEK for $3.

MK-

M-

☐ I enclose payment. ☐ Bill me later.

Name _____ Position _____

Address ☐ Home ☐ Business _____

City _____ Zone _____ State _____

Company _____

Check branch or branches in which you are actively engaged:
☐ Exploration ☐ Drilling ☐ Production ☐ Independent Producer
☐ Refining ☐ Natural Gasoline ☐ Petrochemical Mfr. ☐ Transportation
☐ Supply Stores ☐ Service Company ☐ Equipment Mfr. ☐ Oil Marketing
☐ Other (Please specify) _____

I am: ☐ Engineer ☐ Chemist ☐ Geologist ☐ Geophysicist

PW-11-15

C·T
R TOOL CO.
ERY AND CHEMICAL CORPORATION
South America — East West
otel, Maracaibo, Venezuela.
for All Other Countries to
Houston, Texas.

its courses to meet these objectives:

- Apprentice training to develop such craftsmen as electricians, field machinists, instrument technicians, pipefitters, and welders.
- Upgrading of workers in all classifications.
- Training an individual to do a specific job requiring new skills.
- Training foremen in supervisory techniques.

Management of a major-company refinery has used correspondence courses to upgrade almost all of its skilled maintenance force.

After extensive study, company training men isolated seven general categories of jobs and skills to be considered for training.

Company and ICS officials then developed courses (using ICS materials) to meet the training need of each category. They also worked out a basic course in order to provide the mathematics and craft skills that were common to all categories.

ICS also developed a battery of diagnostic tests to measure each worker's skills in the individual categories of his job. The worker was then trained only to correct apparent weaknesses.

Offshore

OIL INSURANCE

—Loss prevention service included!

YOUR INSURANCE AGENT or broker knows the importance of experienced handling in arranging proper coverage, and he knows how much proper servicing of losses can mean to you. For this reason he will probably recommend placing the insurance on your offshore oil drilling and production equipment with a specialized market such as Southern Marine.

Important too, our Loss Prevention Service (included at no extra cost) is geared to work with you in preventing loss to (1) reduce future insurance costs and (2) prevent equipment down-time. Even with full reimbursement for loss or damage, equipment down-time for repairs knocks out your income. Ask those who use our Loss Prevention Service how well it works.

SOUTHERN
MARINE & AVIATION UNDERWRITERS, INC.
NEW ORLEANS

610 Poydras Street — Telephone TUlane 5266

L. K. GIFFIN, President; LEE M. STENTZ, FRED L. KRIEDT, Vice Presidents

What's New
IN MANAGEMENT

Oil management has got more than its money's worth from its $7-million investment in API research—especially in oil recovery and refining—according to a report at the API meeting in Chicago this week. Reviewing 31 years of progress by the API Fundamental Research Program, Shell Oil's Monroe Spaght (vice-chairman of the API Research Committee) listed such benefits as these:

- API research on wettability has thrown light on extremely complex problems involving the behavior of oil, water, and sand in producing formations.
- Work in geophysics has helped develop better methods of mapping subsurface structures of the earth.
- API studies at California Institute of Technology produced books of highly useful data on the properties of hydrocarbons and their mixtures. Oil-company scientists developed this data into gas-injection techniques that have made possible the recovery of 1.7-billion bbl. of oil.
- Hydrocarbon antiknock data provided by API research is used in judging new processes for improving gasoline octane.
- Oil scientists calibrate their physical instruments with pure reference materials from API research.

"It is no overstatement to say," said Spaght, "that alkylation, isomerization, and dehydrocyclization would not have come into your vocabulary as refinery processes if we had not had available the basic data on hydrocarbons to allow us to design the necessary process equipment."

•

"The best way to find out if a man can do a job," says a top oil executive in the Southwest, "is to make him take the pressure of handling it."

Commenting on his department's system of rotating candidates for promotion through the job to be filled the executive says, "Some men insist they want the extra responsibility. But they don't hold up well under it. Until you actually see a man on the job, you're really only guessing about his ability."

The executive adds, "Trying men out for the same job does have the disadvantage that the losers feel they are not well equipped, when in fact they may be highly capable. This is hard on morale. But there is the advantage that everyone feels he has a chance, and the men really hustle."

This O-C-T branch warehouse in the Midland-Odessa area is typical of the kind of facilities O-C-T has provided to assure you good field service.

SERVICE UNLIMITED

OIL CENTER TOOL COMPANY
WAREHOUSE AND SERVICE POINTS

Corpus Christi, Texas	Natchez, Miss.
Dallas, Texas	Farmington, N. M.
Houston, Texas	Hobbs, N. M.
McAllen, Texas	Williston, N. D.
Midland, Texas	Oklahoma City, Okla.
Odessa, Texas	Casper, Wyo.
Victoria, Texas	Calgary,
Houma, La.	Alberta, Canada
Lafayette, La.	Edmonton,
New Orleans, La.	Alberta, Canada
Shreveport, La.	Maracaibo, Venezuela
Laurel, Miss.	Anaco, Venezuela

During the drilling and completion operations on every well, there comes a time when good service from your equipment supplier can save you money.

O-C-T has earned its reputation for good service by dependable performance in the field year after year.

We can only guess how many thousands of dollars have been saved for the oil industry by prompt O-C-T service. But we do know this: Oil Center Tool Company maintains the largest service organization in the field to help you set and service wellhead assemblies.

It makes a good combination you can count on . . . the most dependable equipment plus the best service in the field.

O·C·T

OIL CENTER TOOL CO.

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

Export Representatives: South America — East West Oiltools, C. A., Del Lago Hotel, Maracaibo, Venezuela. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston, Texas.

sweetens effectively
at one-tenth the cost
of hydrotreating

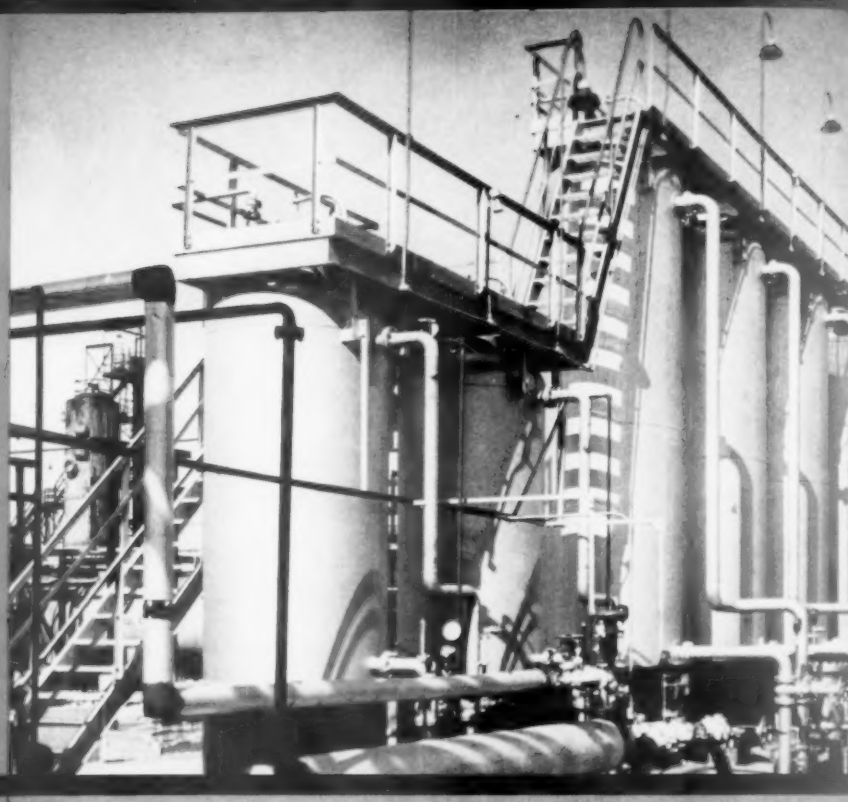
PETRECO-BENDER

catalytic sweetening
for kerosine, gasoline, burning oils

The installation cost of Petreco-Bender catalytic sweetening is only about one-tenth that of hydrotreating. Operating costs are only about 20% of the costs of conventional doctor treating. There are no product losses except those incident to sampling and spillage.

In addition to these obvious economic advantages, the Petreco-Bender process is simple to operate and maintain.

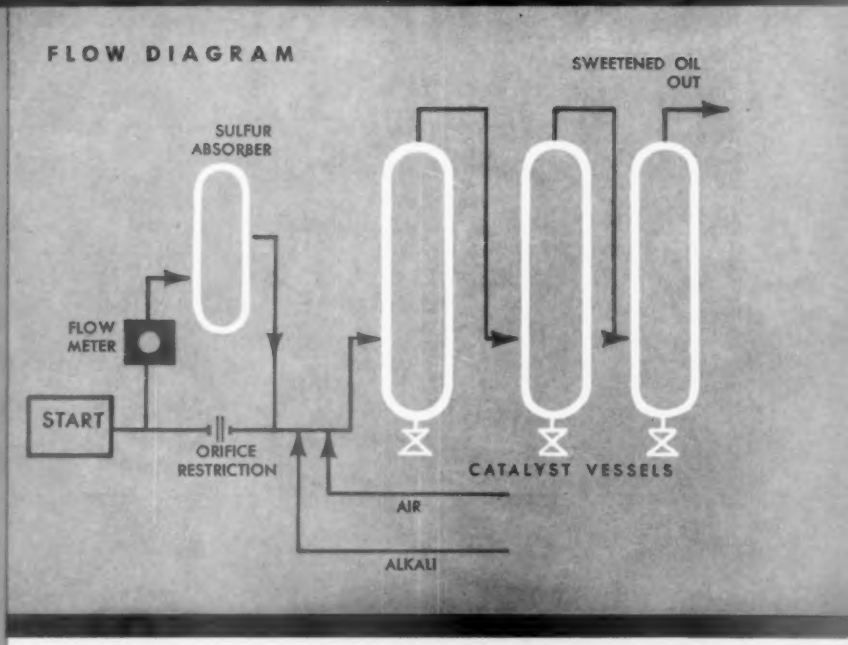
Low capital investment
Minimum operating costs
Negligible product loss
Continuous process
Automatic control
No copper contamination
Long catalyst life
Sweet, non-corrosive product



Typical Petreco-Bender catalytic sweetening plant. This plant is capable of treatment at the rate of approximately 6000 barrels per day.

HOW PETRECO-BENDER CATALYTIC SWEETENING OPERATES

Controlled quantities of sulfur, alkali and air are added to the product stream. The mixture is then passed through a lead sulfide catalyst bed. Sweetening is accomplished by converting the mercaptans to disulfides by oxidation. The treated product is sweet and non-corrosive. Operation is continuous, with automatic controls.



The Petreco Service Engineer in your area will gladly give you complete information. Or, just write or call

PETRECO

A DIVISION OF PETROLITE CORPORATION

3202 South Wayside Drive, Houston 1, Texas
1390 East Burnett Street, Long Beach 7, California

Specialized Electric Petroleum Treating

DESALTING • DEHYDRATING • CAUSTIC WASHING • ACID TREATING
DOCTOR TREATING • SWEETENING • NAPHTHENIC ACID REMOVAL
SEDIMENT REMOVAL

8-57-1

PROOF!

Dav-Ad 101 offers you more advantages than other types of antioxidants!

The proof is in this sample!

Evaluate Dav-Ad 101 for yourself in your own laboratory. Write today for your sample of this superior antioxidant.

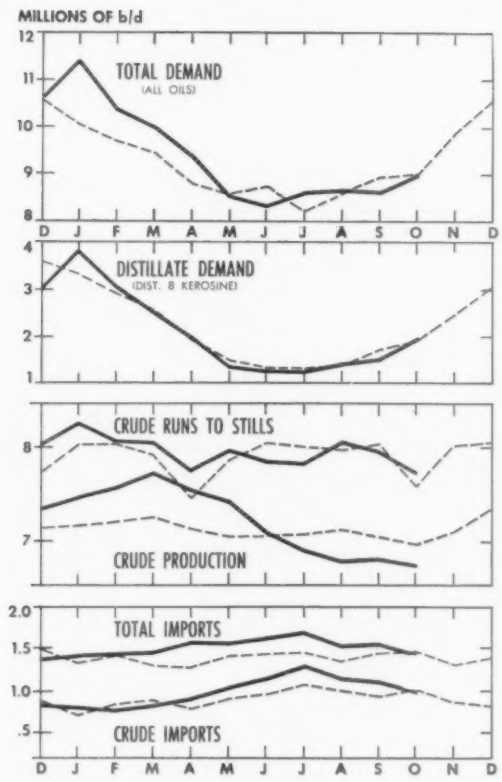
Progress Through Chemistry

DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland

SALES OFFICES: Chicago, Ill.; Houston, Tex.; New York, N. Y.; Baltimore, Md.; San Francisco, Calif.; Tulsa, Okla.
In Canada: Davison Chemical Company Ltd., Toronto.

PETROLEUM WEEK'S

Fingertip Figures



Supply-Demand Figures for October

(millions of b/d)

	October 1957	% Change from year ago	10 Months 1957	% Change from year ago
Total Demand (Inc. Exports)	9.013	+0.7	9.326	+3.6
Gasoline	3.886	—1.8	3.970	+2.3
Distillates (Inc. Kerosine)	1.966	+8.2	2.009	+2.3
Residual	1.486	—3.0	1.595	+1.6
Total Supply	9.012	—3.0	9.529	+2.0
Domestic Crude	6.745	—3.2	7.215	+1.2
Nat. Gas Liquids	.800	+2.2	.785	+0.6
Total Domestic	7.545	—2.6	8.000	+1.1
Crude Imports	1.006	+0.2	1.003	+5.9
Total Imports	1.467	—4.8	1.529	+7.0

RUNS TO STILLS
Latest week *
Previous week 7.580
Year ago 7.964

CRUDE PRODUCTION
Latest week *
Previous week 6.712
Year ago 7.050

TOTAL IMPORTS
Latest week *
Previous week 1.485
Year ago 1.220

CRUDE IMPORTS
Latest week *
Previous week .959
Year ago .797

In October, for the first time since World War II, the rate of new supply fell slightly below demand. It was a much needed help toward correcting the industry's oversupply position.

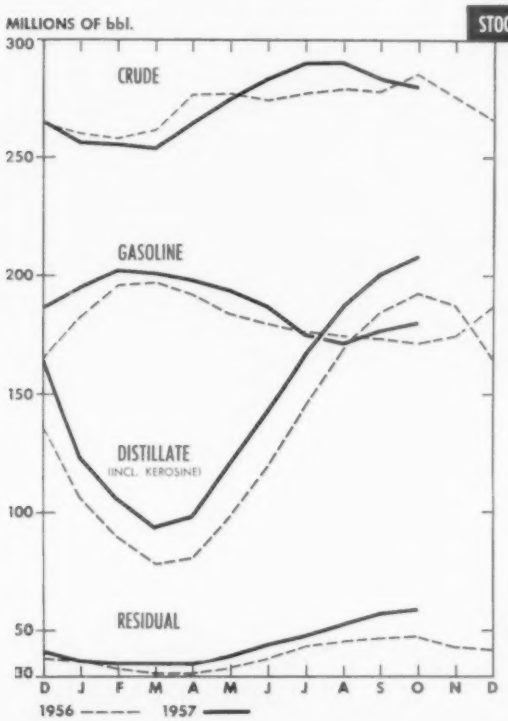
The total new supply—domestic crude, natural gas liquids, and imports—averaged 9,012,000 b/d, or 1,000 b/d below the depressed demand for the month.

But holding the rate of supply down created a burden for domestic producers. Crude production for the month, averaging 6,745,000 b/d, was at its lowest monthly rate since August, 1955. Total imports were at their lowest level since March.

For the year to date, supply has exceeded demand by an average of 203,000 b/d, a decided improvement over the earlier months. But demand in the first ten months ran only 3.6% ahead of 1956 as the margin over last year continued to decline.

* * *

*Due to the API annual meeting, most figures for the week ended Nov. 8 were unavailable at press time.

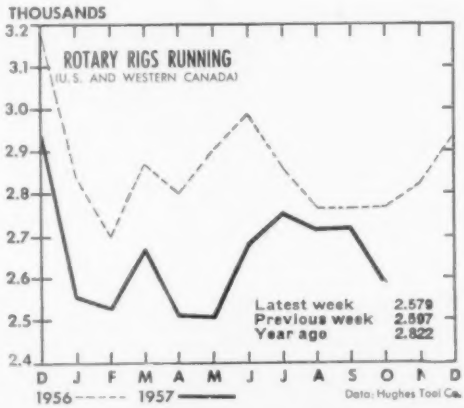


CRUDE STOCKS
Week-ended 11-2 283.1
Previous week 282.4
Year ago 282.8

GASOLINE
Latest week *
Previous week 181.4
Year ago 171.8

DISTILLATES
Latest week *
Previous week 209.1
Year ago 197.8

RESIDUAL
Latest week *
Previous week 59.3
Year ago 47.4


THOUSANDS
ROTARY RIGS RUNNING
(U.S. AND WESTERN CANADA)
Latest week 2,579
Previous week 2,597
Year ago 2,822
D J F M A M J J A S O N D
1956 ---- 1957 ——
Data: Hughes Tool Co.

The Market Trend

For Gulf Independents: Rough Road Ahead

Independent refiners at the Gulf Coast got some more bad news this week. For one thing, an East Coast major closed a long-term 5,000 b/d purchase deal in the Caribbean. Meanwhile, independent offerings at the Gulf are going begging.

A trend is shaping up. The independents at the Gulf appear to be losing ground to the major refiners.

Step by inevitable step, Gulf Coast independents have been missing out on markets. The Upper Midwest got away from them because of pipelines bringing Canadian crude and Mid-Continent products to the mid-Mississippi. The Canadian market got away from them because of cheap ships, Middle East crude, and a products freight advantage from the Caribbean. Just in recent weeks, the last gasoline customer the independents had on the West Coast switched over to a supply source in Netherlands West Indies.

Now, it looks as if the big East Coast market is slipping away from them, too. East Coast majors have just about quit processing U.S. crudes with Gulf Coast independents. (The majors themselves are long on refining capacity.)

There's a price squeeze on Gulf independents, too. Major refiners increasingly are switching over to delivered-price cargo deals with East Coast tanker terminal operators. If independent refiners follow suit, they lose control of their f.o.b. prices. Since they lack the crude holdings of the majors, this could force the independents into unprofitable netbacks.

And this squeeze is going to get worse. This week, news filtered out that a new contract to put foreign crude into an East Coast refinery calls for product prices—on the East Coast, mind—of 4% below cargo prices at the U.S. Gulf.

Thus, an age-old concept that East Coast prices are a build-up from independent Gulf Coast cargo prices is going by the boards. Rather, it will be the reverse: East Coast prices will seek their own level, and the Gulf Coast will have to follow—at lower prices, of course.

So What's Next?

The steady loss of spot cargo markets explains some of the revised aims of Gulf Coast refiners. Several of them who never engaged in retail gasoline operations now are getting into them in a big way. Others are sharpening their pencils when the U.S. military comes in the market for motor fuels and avgas.

'Arouse a Requirement':

Last week, a refiner cabled an international marketer asking what price it would take for the foreign marketer to get interested in a cargo of avgas. The cryptic answer came back: "Arouse a requirement." Apparently, there just isn't any new demand around right now at any price.

Storage vs. Price:

An eastern marketer confesses that his aim is to build enough storage to house his total annual sales. In this fashion, he adds, he can do all of his fuel oil buying in the summer—when prices and tanker rates are low.

The Market Place

AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of November 7

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, Cargoes
- Gasoline, 98 oct prem....12.75-14
- Gasoline, 92 oct reg....11-12.375
- Kerosine....9-10.5
- Heating oil, No. 2....9-10.25
- Gas oil, 48-52 d.i....9.25-10.5
- Fuel oil, bunker "C"....$2.55-2.65

Caribbean, cargoes
- **Avgas, Grade 100/130....17↓**
- **Gasoline, 93 oct research prem....11.25↓**
- **Gasoline, 87 oct research reg....10.375↓**
- **Gasoline, 79 oct research....9.625↓**
- Gasoline, 70-72 oct motor method....9.5
- Kerosine....9.25
- Heating oil, No. 2....9
- Gas oil, 48-52 d.i....9.25
- Fuel oil, bunker "C"....$2.55

New York Harbor, barges
- Kerosine....10.75-11.25
- Heating oil, No. 2....10.05-10.75
- Fuel oil, No. 6....$2.95

Okla-Group 3, northern shpt, bulk
- Gasoline, 89 oct reg....12-12.25
- Kerosine....10-10.5
- Heating oil, No. 2....9-9.375
- Fuel oil, No. 6....$1.75-1.85

Chicago, bulk
- Gasoline, 91 oct reg....13-13.8
- Heating oil, No. 2....9.5-10.65
- Fuel oil, No. 6 high sulfur....7.85-7.95

Los Angeles, rack
- Gasoline, 88 oct reg....13.6
- Diesel fuel, PS 200....10-11.25
- Light fuel, PS 300....$3.40-3.65
- Heavy fuel, PS 400....$2.85-3.05

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....4-5

Penna Lubes
- Bright stock, 25 p.t....27
- 200 vis. neutral, 25 p.t....25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....25.5-26.5
- Neutral solvent, 200-210 vis....21.25-22.25

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26.5
- Neutral, solvent, 200 vis....23

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130....18.625
- Gasoline, 79 oct research....10.5
- Kerosine....10.375
- Gas oil, 48 d. i. minimum....10.375

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9....3.07
- North Dakota, 36.0-36.9....3.07
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....3.07-3.22
  - West Texas, sweet, 36.0-36.9....3.07
  - West Texas, N. M., inter., 36.0-36.9....3.00
  - West Texas, N. M., sour, 32.0-32.9....2.86
  - East Texas, flat....3.25
  - Mirando, 28.0-28.9....3.31
- Illinois Basin, flat....3.15
- Pennsylvania Grade, Bradford dist. flat....4.65
- California Signal Hill, 21.0-21.9....2.93†
- North Louisiana-Arkansas, 36.0-36.9....2.92-3.02
- Wyoming sweet, 36.0-36.9....3.00
- Wyoming sour, 32.0-32.9....2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.)....2.68
- Leduc-Woodbend (Alta.)....2.74
- Redwater (Alta.)....2.63
- Daly (Man.)....2.46
- Smiley (Sask.)....2.40

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido....3.75
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.34
- Oficina, 35.0-35.9, Puerto la Cruz....3.05
- Tia Juana, Medium, 26.0-26.9, Amuay....2.55
- Bachaquero, flat, Amuay, Las Piedras....2.23
- Tarra, 38.0-38.9, San Lorenzo....3.08
- Lagunillas Heavy, flat, Amuay, Cardon....2.38

†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....2.08
- Safaniya, 27.0-27.9, Ras Tanura....1.79
- Iran, 34.0-34.9, Bandar Mashur....2.04
- Iran, 34.0-34.9, Abadan....1.99
- Iraq, 35.0-35.9, Fao....1.98
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.85
- Qatar, 41.0-41.9, Umm Said....2.23

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon....2.59
- Iraq, 36.0-36.9, Tripoli, Banias....2.59

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, 37-38....2.75

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- **U.S. Gulf-New York, clean....(USMC —25%) $2.14↓**
- **U.S. Gulf-New York, dirty....(USMC —30%) $2.00↑**
- NWI-USNH, dirty....(USMC —55%) $1.22
- NWI-UK/Cont. dirty....(Scale —30%) 22/9*
- Persian Gulf-UK/Cont. dirty....(Scale —52½%) 29/–*
- Persian Gulf-USNH, dirty....(USMC —50%)$6.35

**Sterling*

DEPT/Marketing

Should Stations Offer Motor Tuneups?

YES, say many marketers:

- It boosts gallonage and TBA sales.
- It gives dealer bigger profits.
- Customers want this service at neighborhood stations.

NO, say others, emphatically:

- It interferes with selling of gasoline and TBA.
- Tuneup work clutters up stations.
- It ruins uniformity of service.

Suppliers and dealers are looking on motor tuneups at stations with increasing favor—in spite of some loud arguments against it. Some majors are promoting it for the first time, according to a special report by National Petroleum News, McGraw-Hill's magazine of oil marketing.

Most oil companies have traditionally opposed tuneups at stations. They have argued that it detracts from the main job of selling gasoline and oil, that the attendant gets his hands greasy, or that the station gets cluttered with tools. NPN's survey of 26 companies shows that this attitude is on its way out.

In reporting a recent private survey, NPN finds that: 59% of all service stations today do electrical and ignition work; 88% of dealers stock some type of electrical parts; and 98% buy parts from auto jobbers.

Tuneup work at repair garages, on the other hand, is on the downtrend —dropping from 30% of the business in 1948 to 24% in 1955.

As more and more dealers take on tuneup work, the one-time resistance to it is fading.

Some big factors behind the uptrend; more cars on the road; more complex cars; and growing customer demand for one-stop service at a neighborhood station.

Auto registrations are at an all-time high. Used cars are being driven more miles before being scrapped. This means more calls for motor tuneups. Repair garages—often bogged down with heavy repairs—can't keep up with all the business. So customers naturally turn to service stations for motor tuneups.

The complex design of today's cars is forcing the "do-it-yourself" car owner to leave the fine adjustments on his auto to the experts.

The customer isn't taking a back seat either. He wants his tuneups done by "his" dealer, in "his" neighborhood station—without having to wait long hours for service in a crowded garage staffed with high-cost mechanics.

Another big factor: The customer likes the idea of one-stop service. He likes to take care of as many of his auto's needs in one spot as possible. If he can't get this in his neighborhood station, he may look for a station where he can. This situation led one midwest jobber to remark, "The dealer, sometimes, has almost no choice in going into tuneup work."

In spite of this growing trend however, the question is still being debated by marketers.

Ranking high on the proponent's list of arguments: Tuneup can mean a welcome source of added income for the dealer—faced with shrinking margins, high operating costs, and tougher-than-ever competition.

Some companies are more pro-tuneup than others, according to NPN's survey. Typical of the comments of major-company officials who favor tuneups:

"The trend is toward more service. Anything that increases the revenue of dealers is good for us."

"The dealer has one or two bays that cost him money to operate. If he could use them for mechanical work and make money, he'd be better off."

Estimates on tuneup profits range from the low hundreds into the thousands—depending on how well it's done and how hard it's promoted. Average gross margin on labor and parts is about 40% to 50%, according to survey results.

In a recent survey of one market, 90% of the dealers reported that offering tuneups also helped increase their gasoline and lube sales.

A loud, but shrinking, segment of marketers is sticking to its guns in opposition to tuneups. Their arguments: Tuneup work is messy; it distracts the dealer from his main job of selling gasoline; and one bad job will turn business away.

Another argument against tuneups is that they make it too easy for a dealer to "get in over his head."

One major company told NPN that it objected to tuneup service because it wants "strict uniformity of service throughout all stations. Tuneups and light repairs would completely ruin that uniformity."

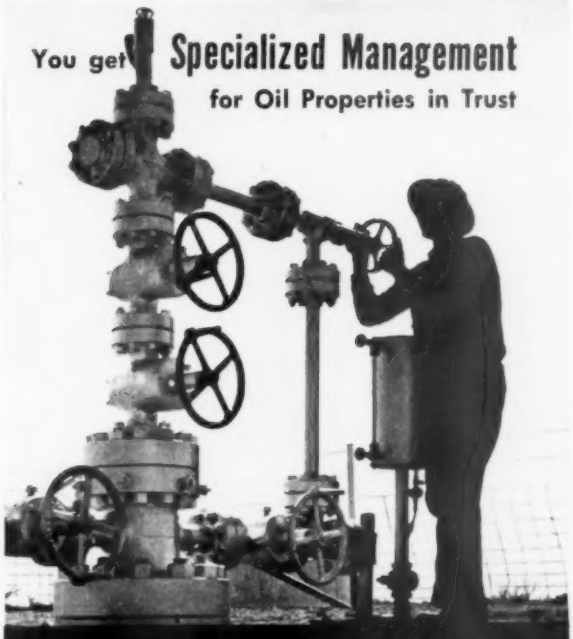
A lot of companies are "on the fence" regarding tuneups. Some want to study it more before taking a stand; others encourage tuneups only for certain dealers.

Some company studies have been instigated because independent dealers took the initiative in going into tuneups. Such studies are now being conducted by Union Oil of California and Cities Service.

Socony is cautious about promoting tuneups, saying that "each station must be judged individually."

Other companies give the green light to tuneups with these reservations: if there's plenty of space; if the dealer has proper equipment; if

You get **Specialized Management** for Oil Properties in Trust



Write: Personal Trust Department

Mercantile National Bank

Dallas, Texas

Member Federal Deposit Insurance Corporation

All day long, it's RUSH—RUSH—RUSH!

But there's still time to be well informed on the whole oil industry—with Petroleum Week's variable-speed reading

You get a fast-reading summary of every story, just by scanning the bold-face type. This gives you the essential facts and main points of interest in quick, capsule form.

The complete details of each article follow in light-face type. To get the whole story, on items of particular interest, just read the light-face type as well as the bold.

This variable-speed reading technique, pioneered by Petroleum Week, was designed for busy men like you – to give you the industry-wide oil information you want and need, in the shortest possible time.

BLUE WATER NO. 1

...another example of **INGALLS' SKILL**

First submersible oil drilling platform built for the new Blue Water Drilling Corporation, the INGALLS-built "Blue Water No. 1" is the prototype of a new design already proved in Gulf drilling operations. Capable of drilling six wells without relocating in water up to 70 feet deep, the "Blue Water No. 1" is one of the largest submersible oil drilling platforms ever to go to sea. *Consult* INGALLS *for your offshore drilling requirements.*

THE INGALLS SHIPBUILDING CORPORATION

Executive Offices: Birmingham, Alabama

Branch Offices: New York, Washington, New Orleans, Chicago, Philadelphia, Atlanta, Houston

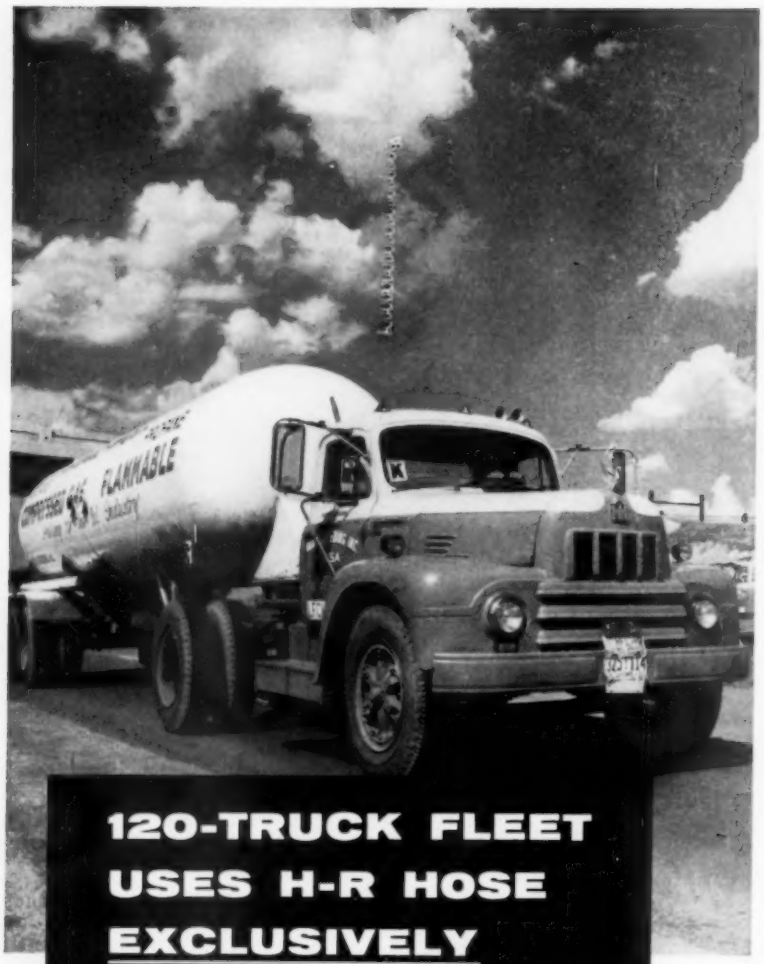
Shipyards: Pascagoula, Mississippi; Decatur, Alabama; Arnold V. Walker Shipyard, Inc., Pascagoula, *a subsidiary*

Complete Dry Docking Facilities at Ingalls Decatur yard

Additional Marine Ways at its subsidiary, the Arnold V. Walker Shipyard, Inc., Pascagoula, to handle all types of repair work

DESIGNERS & BUILDERS of Offshore Service Vessels, Commercial and Drilling Barges, Tankers, Naval, Merchant Vessels

ENGINEERS: for jobs with a future, contact Ingalls today



120-TRUCK FLEET USES H-R HOSE EXCLUSIVELY

Hugh Breeding, Inc., Tulsa, Oklahoma, serves the oil industry with a massive fleet of modern trucks and trailers all equipped with Hewitt-Robins hose: Tank trailers handle gasoline, fuel oil, jet fuel, hot road oil and similar petroleum products with Maltese Cross tank car hose; and LPG trailers are equipped with Maltese Cross propane-butane hose.

Both types of H-R hose provide peak performance demanded by petroleum haulers. Their safety, flexibility, and ease of handling are appreciated by drivers. Their stamina, built-in toughness, and long service life appeal to cost-conscious management. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

the dealer sticks to "light" tuneups.

Even within companies there is disagreement, as evidenced by one marketer's comment: "Our dealer-training schools teach new dealers . . . that tuneup is the modern way to run a station. But in the divisions, he is told that it will ruin his gasoline business."

Even marketers who favor tuneups recommend precautions. If the dealer doesn't have control, he's in for it. Marketers surveyed by NPN set up four rules:

(1) Keep a sharp eye on other parts of the business. Station cleanliness and good service are doubly important.

(2) Offer a full line of tuneups, but avoid heavy work.

(3) Maintain constant high-quality work. One bad tuneup will drive business away, no matter how good other services may be.

(4) Keep trained mechanics busy all the time, with tuneups on an appointment basis.

In spite of the advantages, many dealers can't go into tuneups because they don't have the money for intricate equipment and mechanical training.

The cost of installing equipment needed for light tuneup work can go as high as $3,000, according to NPN's special study. This prohibits many dealers from going into tuneups without a time-payment plan.

Finding the men who have the necessary skills to do tuneups on today's cars is also a headache. As car design gets more complicated, so do the tuneup jobs that go with them. This means that men have to be trained for this work. And even with thorough training, it takes on-the-job experience to produce a good tuneup man.

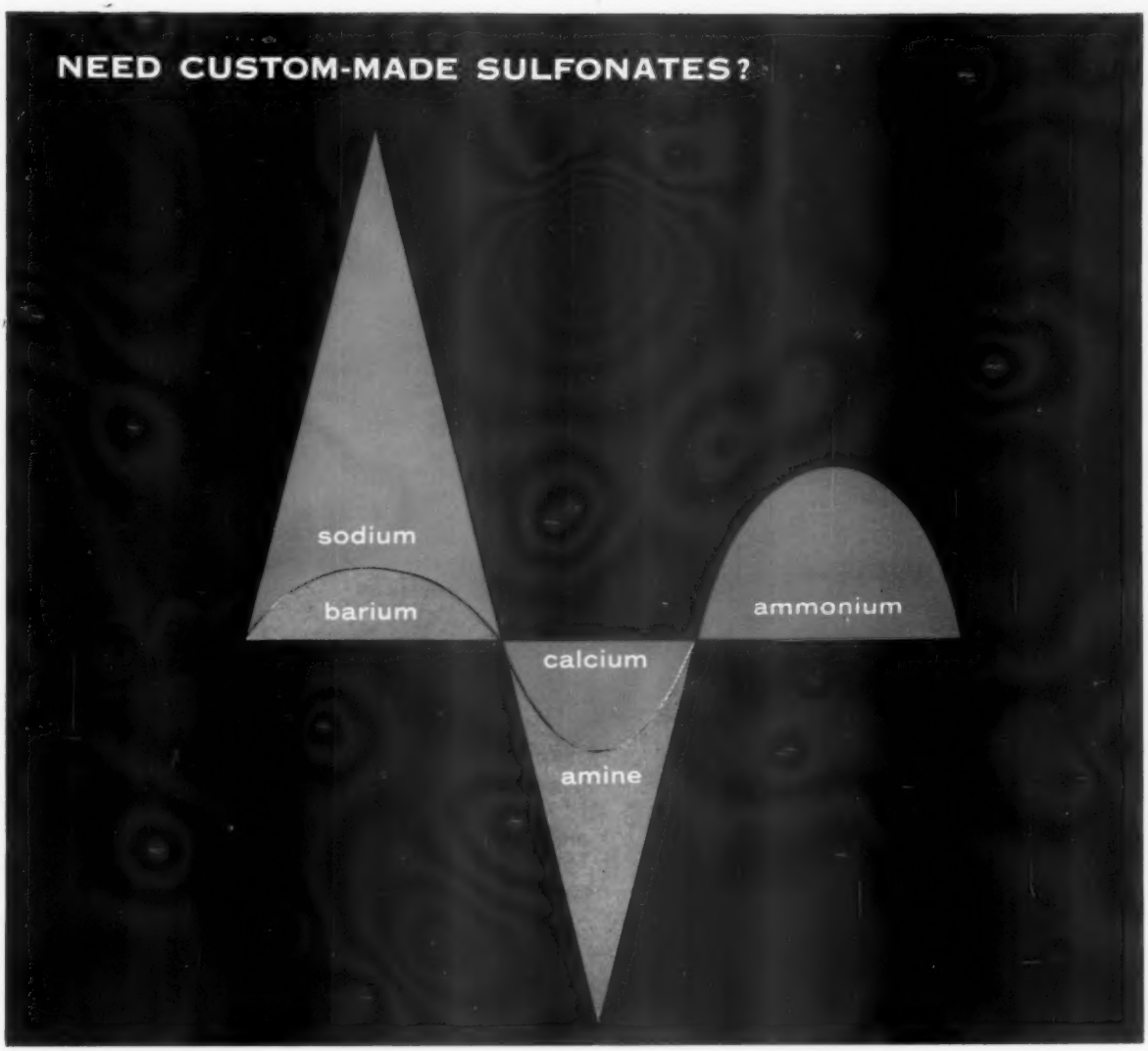
But some suppliers are coming to the rescue with training schools, financial aid, and studies aimed at helping dealers with tuneup work.

Shell, Conoco, Esso, and Richfield of California already have programs to help dealers get more training and better equipment.

Equipment manufacturers' schools are drawing large numbers of station men as trainees. Some courses are free, others cost up to $50.

Shell sponsors a package equipment deal for its retailers, and has worked out arrangements with manufacturers for dealers to buy equipment on time. In addition, Shell is experimenting in one area with the possibility of doing automatic-transmission adjustment work at stations.

Richfield of California is handling



BRYTON®

can suit you . . . exactly

Bryton welcomes the chance to custom-tailor petroleum sulfonates to your most exacting requirements. Development of new and distinctly different types of products is an integral part of Bryton operations. So if you're thinking along these lines, it's worth mentioning that Bryton's greatly expanding facilities include a growing staff of trained technicians to help you with your problems.

Whatever your specific needs, Bryton is outstandingly qualified to serve as your sulfonate headquarters . . . offering you the broadest line with the utmost assurance of uniformity and quality, time after time.

For additional information, write:
Bryton Chemical Company, Dept. R-11,
1270 Avenue of the Americas,
New York 20, N. Y.

BRYTON SULFONATES
Specific Sulfonates for Industry

© 1957, Bryton Chemical Company, Trainer, Pa.

New profits
from
made-to-order oils!

You can get an added source of income, at no extra cost, by providing your customers with custom-formulated oils.

By tailoring Oronite additives to your base oil, you can furnish your customers with exclusive made-to-order oils.

The rapid growth of Oronite, as a major lube oil additive supplier, can be attributed to a willingness to custom-formulate for oil marketers—meeting price and performance specifications. Oronite has compounded and engine tested hundreds of additive compounds and is currently supplying over a hundred different formulations.

It will pay you to discuss compounded motor oils with Oronite. Write or phone our office nearest you.

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES
200 Bush Street, San Francisco 20, California

SALES OFFICES: San Francisco, New York, Wilmington, Chicago, Dallas, Cincinnati, Los Angeles

EUROPEAN OFFICE
36, Avenue William-Favre, Geneva, Switzerland

4167

a complete line of electronic tuneup testing equipment for resale to its dealers.

Some companies are incorporating tuneup training in their dealer training programs. Cities Service and Esso, for example, are doing this—in addition to encouraging their dealers to attend equipment schools.

Several companies allow dealers to carry tuneup work on credit-card accounts, and more are following suit. Shell dealers can put up to $50 in service charges on credit. Esso allows installation of parts to be charged on credit cards. Gulf allows service work to be charged "under limited conditions."

Station tuneups on a large scale could change the whole face of the service station business, say some marketers surveyed by NPN.

Most marketers agree that a bigger share of tuneup work will go to service stations in the future. And with this will come a greater concentration on training to perform these services.

Some other innovations mentioned by marketers as possibilities for the future:

- Skilled mechanics working in stations on a commission or contract basis.
- Oil-company support of training programs in high schools to teach tuneup and light repair.
- Changes in station design and merchandising methods. (One major is reportedly willing to spend $15,000 to $20,000 per outlet to enlarge and remodel stations to accommodate tuneup work.)
- Establishment of tuneup stations around a centrally located parts depot, to permit rapid delivery of parts.
- Creation of superservice centers—multibay, multipump outlets with a full range of tuneup service and light repairs.

Survey: Whence Dealer Profits?

Higher gross margins and close control over expenses, rather than volume alone, are cited as the key to service station profits in a "cost of doing business" survey by Dun & Bradstreet, Inc. The study is based on reports from 516 stations in 1956 Highlights of the findings:

Volume. Typical station sales volume was $89,265, some $27,000 above the $62,950 reported in a similar 1951 survey. Annual gasoline sales averaged 203,000 gal. Stations with a volume of $125,00 or more operated most efficiently, with net profit before taxes averaging 1.7%. As sales volume decreased, so did net profits.

Gross margin. Over-all gross margin averaged 23.2% of net sales, compared to 22.6% in 1951. Gross margin on gasoline was 18.9%; on all other merchandise, 34%.

Expenses. Average dealer's total expense was 22.1% of net sales, up 1.4% from 1951. Employees' wages were the largest expense item, amounting to 8.1% of net sales. Rent plus utilities averaged 4% of net sales, except for operators who owned their own stations. For them, this expense was 2.8% of net sales.

Net profit. Net profit, before federal and state income taxes, averaged 1.1%, compared to 1.9% in 1951. The average operator's earnings were $127 per week in salary, plus net profits. About 18% of the dealers surveyed averaged $233 weekly in salaries, plus net profits. At the other end of the scale, 34% of those surveyed showed a net loss after deducting their own salaries. The typical "unprofitable" operator drew a salary of $5,397—which put the business $875 in the red.

Credit. Dealers whose credit sales amounted to 35% to 50% of total sales reported the highest sales volumes. As credit sales passed the 50% mark, net profits were less. Increases in credit sales generally were accompanied by higher gross margins, larger expenses, more rapid turnover of gasoline and other merchandise.

The Microwave Radio System *that Grows... as you Grow!*

RCA Microwave Radio Systems are designed with future needs in mind. They do not face obsolescence because of users' growth. High channel capacity permits orderly growth up to a total of 120 channels for voice, data transmission, supervisory control and other purposes.

RCA was one of the earliest pioneers in the development of microwave for commercial communications. Today, RCA Microwave Systems provide users throughout the world with many important features . . . operation in the most advantageous frequency bands, simplified installation and minimum maintenance cost.

Serving their users with dependability and precision, RCA Microwave Systems are now operated by utilities, gas and petroleum pipelines, cross country turnpikes, and government agencies.

More than a million channel miles of RCA Microwave Systems in service . . . performance proved throughout the world.

RCA Microwave specialists will be glad to answer any questions and help plan your installation. Mail coupon for further particulars.

SPECIAL NOTE TO RCA CUSTOMERS:

Ask about the RCA "Package Expansion Plan" which confirms your wise choice of RCA CW-20 or MM-26 Microwave for your communications system. A minor field modification will bring your system up to 48, 72 or even 96 channel capacity, depending on your revised requirements.

RADIO CORPORATION of AMERICA
COMMUNICATIONS PRODUCTS
Camden, N.J.

Radio Corporation of America
Communications Products
Dept. ZB-280, Building 15-1, Camden, N. J.

☐ Tell me more about RCA "Package Expansion Plan." We have RCA_____Microwave.

☐ Send latest literature on RCA Microwave Radio for use in _____

NAME _____ TITLE _____
(PLEASE PRINT)

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ COUNTY _____ STATE _____

☐ Have representative contact me.

What's New / IN MARKETING

Anti-trading-stamp legislation is being considered by the California state legislature. A subcommittee heard testimony for and against the legislation last week, with hearings continuing this week.

Two measures are under consideration: One would outlaw all stamps and other premiums; the other would force trading-stamp firms to pay a tax on stamps (enough to make the cost of stamps prohibitive).

The subcommittee is expected to make a recommendation to the state assembly next spring, based on hearings now being held "to determine whether or not it would be in the public interest to curtail giveaways."

for QUALITY... QUANTITY... SERVICE

Whatever the GRADE and the VOLUME of

NATURAL GASOLINE

Just rely on WARREN'S versatile facilities to give you dependable deliveries ... WHERE and WHEN and the WAY you want them.

WARREN

PETROLEUM CORPORATION

TULSA, OKLAHOMA • Cable Addresses: STAVOLENE, WARREN

EXPORT TERMINALS: CORPUS CHRISTI, PORT ARTHUR, BAYTOWN, TEXAS CITY AND WARRENGAS (HOUSTON), TEXAS, SAN PEDRO, CALIF.

Good Plant Sites and Good Living go Hand-in-Hand in

TIDEWATER VIRGINIA

Within one of the most desirable living and recreational areas of the nation — our Tidewater Virginia area — industry has a choice of literally hundreds of carefully catalogued prime plant sites. These sites are enhanced by the advantages of the world renowned harbor of Hampton Roads, outstanding transportation facilities, world banking services, ready skilled and unskilled labor, easy access to raw materials, power, fuel, and water.

The Tidewater Virginia Development Council offers you, without obligation, a confidential survey of this area in relation to your site selection problems and industrial needs. We invite you to communicate with us.

tidewater virginia Development council

equitable building — norfolk 10, virginia

TVDC

The TVDC includes the cities of Franklin, Portsmouth, Norfolk, South Norfolk, Suffolk, Smithfield, and Virginia Beach. The counties of Isle of Wight, Norfolk, Southampton, Accomack, Nansemond, Princess Anne, and Northampton.

The spread in motor-fuel octane numbers is going to be even greater in the years ahead, according to a Sun Oil Co. research executive.

"The 1958 model automobiles will be even higher in horsepower, with some up to 400," says Dr. Charles L. Thomas, Sun's director of research and development.

Dr. Thomas told a meeting of the Automotive Old Timers, in Philadelphia, "Many more billions of dollars will be needed in the year ahead to keep up with the demand for more and better motor fuels. All signs point to a continuation of the trend toward greater power, with still higher compression ratios and improved fuels to give greater economy in engines."

•

Oil marketers last week got a break from the tax collector.

The Internal Revenue Service handed down a ruling that the federal transportation tax on property doesn't apply to commissions paid to jobbers for the sale and distribution of petroleum products.

The IRS ruling says that when a jobber delivers products from his bulk plant to a customer, it's merely incidental to his primary business of "selling." Therefore, he cannot be considered a "person engaged in the business of transporting property for hire."

•

Carter Oil Co. now has three "roving classroom" units to be used in its dealer training program.

The trailer units, manufactured by Spartan Aircraft Co., are 10 ft. wide and 45 ft. long. They are equipped with conference tables, chairs, blackboard, and instructor's stand. Each air-conditioned classroom can accommodate ten students, with ample space for automotive and equipment displays used in the visual aid phases of the six-week course.

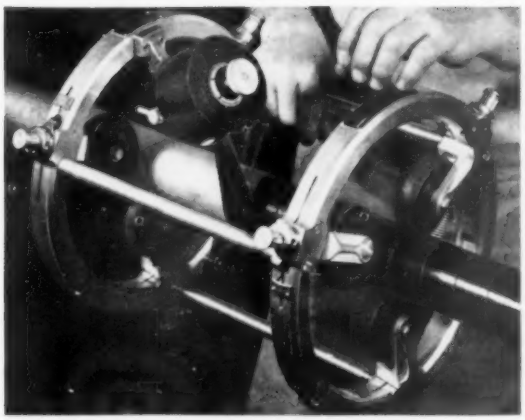
The three units are now stationed at Billings, Mont., Denver, and Seattle. However, they can easily be moved to new locations—within traveling distance of dealers in any part of Carter's ten-state marketing territory.

•

A special drum-rinsing machine, developed and patented in Australia, is being used by the oil industry there to cleanse oil drums in country depots.

The new machine is reportedly completely explosion proof, relatively inexpensive, and simple. A 44-gal. drum, "in the worst condition," can be completely cleaned in 55 seconds.

One of these three is the tape coating for you



Polyken No. 900—12 mils, the original all-inclusive tape coating for straight-run applications.

Polyken No. 920—20 mils, thick and tough for heavy-duty use on straight runs, yet it's conformable, too.

Polyken No. 940—12 mils, just the right balance between elasticity and super-conformability for use on irregular pipe structures.

Only if you use a *Polyken* polyethylene tape on *accessory* jobs are you getting the most for your money

Whatever your need in accessory tape coatings, you will find a *better* solution at *lower* cost with one of these Polyken tapes.

Top corrosion fighter

Why Polyken? Because only Polyken has successfully developed the complete line of polyethylene tape coatings. And no other tape coating—*absolutely none*—can match the remarkable properties of Polyken polyethylene:

- **tough and elastic**
- **unplasticized, non-drying film**
- **doubly thick adhesive to seal all voids**
- **far higher adhesion for a true bond to pipe surface**
- **lower water vapor transmission rate**
- **higher electrical insulation resistance**
- **better cold weather handling and durability**

Compare the cost of each Polyken tape with that of the competitive tape it surpasses. See for yourself on your next purchase order.

Here is your Polyken Distributor . . . Contact him now.

Atlanta, Georgia: Anti-Corrosion Mfg. Co., Inc.
Chicago, Ill.: Sales Engineering, Inc.
Cincinnati, Ohio: Hare Equipment
Cleveland, Ohio: The Harco Corp.
Des Moines, Ia.: The Donald Corp.
Fort Worth, Texas: Plastic Engineering & Sales Corp.
Harvey, La.: Allen Cathodic Protection Co.
Kansas City, Mo.: Industrial Coating's Engineering Co.
Long Beach, Calif.: Barnes & Delaney
Minneapolis, Minn.: Simcoe Equipment Co.
Oakland, Calif.: Bison Co.
Philadelphia, Pa.: Harold N. Davis Co.
Pittsburgh, Pa.: Royston Laboratories, Inc.
Plainfield, New Jersey: Stuart Steel Protection Corp.
St. Louis, Mo.: Shutt Process Equipment Corp.
San Francisco, Calif.: Aetna Sales Co.
Seattle, Wash.: Farwest Corrosion Control Corp.
Seattle, Wash.: Pacific Water Works Supply Co.
Tulsa, Okla.: William Cluff Corp.

Complete catalog, Sweet's Industrial Construction File, Sec. 31/Ke

Polyken®

PROTECTIVE COATINGS

THE KENDALL COMPANY
Polyken Sales Division

DEPT/Personals

J. D. FOSQUE has been elected a vice-president of California Texas Oil Co., New York. He was formerly managing director of Caltex (India) Ltd. In 1954 he returned to New York to take up the position of European general manager of the parent company. In his new position, Fosque will direct the marketing and refining service activities of Caltex on behalf of all the Caltex companies in Europe and Africa.

J. D. Fosque

C. T. Carter

CHARLES T. CARTER, formerly general manager of crude lines for Sinclair Pipe Line Co., has been named director of engineering, in Independence, Kan. **L. C. Foy** succeeds Carter as general manager and **W. M. Bellairs** takes over Foy's position as assistant general manager of crude lines. Bellairs, with Sinclair since 1937, was named assistant chief engineer in 1953, and in 1956 was placed in charge of construction of the Tecumseh Pipe Line.

DEL PYLE, petroleum engineer for Union Oil Co. of California, is transferring from Coalinga to Bakersfield, Calif., succeeding **Jess Dickerson** who has joined another company. **Jim Bailey** moves from Coalinga to Bakersfield as production foreman for the Arvin area.

HARLAND E. NEWMAN has joined the research department of Lion Oil Co., a division of Monsanto Chemical Co., at El Dorado, Ark. He was formerly associated with Arion Oil Co. of California. **Joe Walter** is transferring from Casper, Wyo., to Wichita, Kan., as scout, replacing **Bob Roth,** who has resigned.

GEORGE W. COMANICH is the new division engineer for Texas Eastern Transmission Corp., Division II headquarters, Seymour, Ind. He was formerly senior assistant engineer in the general office pipeline department, at Shreveport, La.

GEORGE B. McLEAN has been promoted to district manager of Standard Oil Co. of California's Hawaii division, in Honolulu. He succeeds **Gordon O. Macauley,** who, as previously reported (PW—Nov.1'57,p54), moves to Portland, Ore., as regional manager for Stancal. **R. W. Thomas,** district sales manager in Tucson, Ariz., will replace McLean in Honolulu as assistant manager.

G. B. MALLUM has been advanced to division attorney at Ft. Worth for Sinclair Oil & Gas Co. He succeeds **Nat J. Harben,** who has transferred to the New York legal staff of Sinclair Oil Corp. Mallum was formerly on the legal staff of the Houston division. **Layton A. Webb,** attorney for the Midland (Tex.) division, becomes division attorney at Midland, a newly created position.

FRED GLASCO has resigned as district landman for Lion Oil Co., a division of Monsanto Chemical Co., to become an independent with headquarters in Wichita, Kan.

TIDEWATER OIL CO. has appointed four new supervisors at its Delaware refinery. **Clifford A. Phillips** is superintendent of crude, coking, and cracking; **Glenn W. Wimberley** succeeds him as supervisor of the desulfurizing and hydrogen area. Replacing Wimberley as technical foreman of the reforming and extraction area is **William E. Baston. John M. Wright,** formerly assistant engineer in the technology group, succeeds Baston as staff engineer of the reforming and extraction area. In New York, **William W. Kerrigan** becomes credit card supervisor of Tidewater's eastern division marketing department. He was formerly service station sales supervisor of the New York district.

KARL F. MARTIN, JR., will head the newly established Canadian exploration division, in Calgary, for Sunray Oil Co. of Oklahoma, wholly-owned subsidiary of Sunray Mid-Continent Oil Co. He was formerly a landman for the company.

CLARENCE BOONE, commission agent for Humble Oil & Refining Co. in Refugio, has been elected president of the Petroleum Marketers Assn. of Texas. He succeeds **S. Reagan Parker,** Gulf Oil Corp. consignee at Lufkin.

BRUCE D. CARROLL will manage operations for Canfield Oil Co., Cleveland, a Sohio subsidiary. He assumes this newly created post after working for the past year as engineer on Sohio's home office manufacturing operations staff.

B. D. Carroll

E. V. Bond, Jr.

EDMOND V. BOND, JR., assumes the newly created post of superintendent of Trunkline Gas Co. of Houston's production operations. He has been with Southern Production Co. since 1948, most recently as general superintendent.

HARRY F. SUNIVILLE has been named treasurer of Utah Southern Oil Co., Salt Lake City, succeeding **De Witt Van Evera,** who has retired. Suniville is a partner of Goddard, Suniville & Griffin, certified public accountants.

R. C. (Chuck) SYRING is transferring from Plentywood, Mont., to Williston, N. D., and has been promoted to drilling superintendent of Noble Drilling Co.

COLT SOMERS is transferring to The Hague, Netherlands, as assistant manager of Esso Research & Engineering Co.'s European office. Three construction engineering men, **Jennings (Jack) Allen, Henry Grundig,** and **Walt Sullivan,** have been appointed section heads in The Hague. They are currently on assignment in Europe. In the company's Linden (N. J.) plant, four new appointments have been made in the chemical research department. **Bob Leary** is the new assistant director of exploratory research work in petrochemicals outside the field of polymers. **John Johnson** becomes head of the process research section, succeeding Leary; **John Rehner** is in charge of exploratory low-temperature polymers; and **Neil Baumgartner** heads the newly created exploratory organic synthesis section. In chemical development, **John Hunt** and **Don Wood,** both acting section heads, have been promoted to section heads; and **Jack Ryan** becomes an acting section head. **Ralph Cardello,** of the planning engineering department, will be head of the project planning section.

H. M. McCLURE, JR., Alma, Mich., is the new president of the National Stripper Well Assn., succeeding **W. G. Powers,** Huntington, W. Va. Other new officers are **W. M. Shoemaker,** Bradford, Pa., first vice-president; and **E. M. Seydell,** Wichita Falls, Tex., second vice-president. **Fred Sehmann,** Wichita Falls, has been reelected secretary-treasurer.

W. H. DRUSHEL has been promoted to assistant general superintendent of drilling and production for The Texas Co.'s domestic producing department, in Houston. **John M. Wilson,** London manager of the Iranian Oil Consortium's technical services department since December, 1955, will succeed Drushel as superintendent of Texaco's eastern district, at Liberty, Tex. In the company's research and technical department, Beacon, N. Y., **A. R. Vander Ploeg** advances to the managerial staff, as assistant to management. He was formerly assistant director of research at the Port Arthur-Port Neches (Tex.) research laboratories.

J. W. WILSON transfers to Oklahoma City as regional geophysicist for Continental Oil Co.'s central region. He succeeds **E. L. Mount,** who recently was promoted to superintendent of the geophysical section's operations division at Ponca City, Okla. In the Ponca City transportation department, **Taz E. Nicks** and **Doyle S. Smith** become assistant managers, traffic and administrative, respectively. Nicks, formerly chief clerk, succeeds **T. R. Lane,** who is

6 Sound Answers to 6 Reasonable Questions about

TODAY'S GASOLINE!

Most Americans think of the oil industry in terms of gasoline. The better they understand gasoline – the better they understand you and your industry. So keep your friends and customers informed by keeping yourself informed about *the facts of today's gasolines!*

Q. Why has the price of gasoline gone up in the past 5 years?

A. Like everything else, gasoline has gone up in price–but very little. Big boosts in gasoline quality have more than made up for the small increase in price. And, of course, taxes on gasoline have gone up, too.

Q. Just how much are these gasoline taxes?

A. Direct taxes–Federal and State–now add 8.9¢ (national average) to the price of every gallon of gasoline. This adds 40¢ to every dollar spent for today's gasoline.

Q. And how much has the price of gasoline gone up?

A. The actual price of the gasoline itself has risen less than 6% in the past 5 years. Compare that with the price increases on other items you buy every day.

Q. What are these big boosts in gasoline quality?

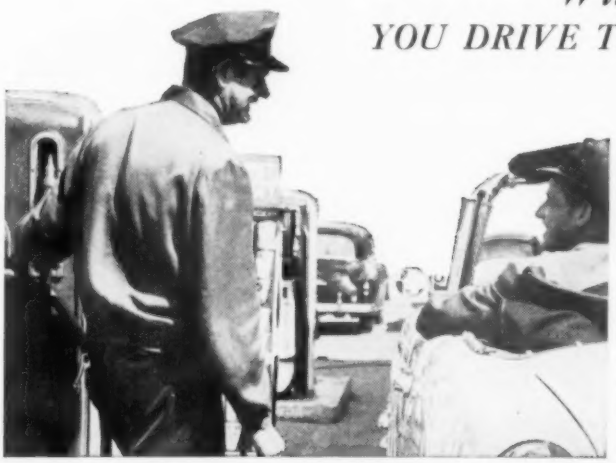
A. Well, today's "regular" gasoline is as good as "premium" gasoline was just 5 years ago.

Q. And what about today's "premium" gasoline?

A. Today's "premium" is as powerful as fighter plane gasoline at the end of the last war.

Q. Why do I need these "higher-powered" gasolines?

A. Today's powerful engines demand these improved fuels for efficient operation. The gasoline of your father's day would be completely inadequate in today's modern car.



With Today's Gasoline
YOU DRIVE THE BEST BARGAIN IN YEARS!

Clip this coupon for more information about today's gasoline and your industry!

American Petroleum Institute, Dept. G
50 W. 50th St., New York 20, N. Y.

I would like to obtain more information about today's gasoline quality, prices and taxes. Please send me your FREE booklets.

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

due to retire soon. Smith has been a transportation analyst. **W. H. Scheihing** becomes director of Conoco's tabulating accounting division in Ponca City, and **P. K. Moore** succeeds him as assistant director of the division. Moore was formerly assistant director of the office methods division.

RICHARD deY. MANNING, legal counsel of Commonwealth Oil Refining Co., has been elected secretary of the company. He will make his headquarters in the company's New York offices.

R. deY. Manning

R. W. Reed

RANDAL W. REED has been named controller of Atlantic Refining Co., Philadelphia, succeeding the late **Verl L. Elliott.** He has been assistant controller since June, 1955.

WALTER J. HARRISON, JR., of Wilmington, Del., becomes refinery representative at Tidewater Oil Co.'s new Delaware refinery, succeeding **Rowland S. Stanfield,** who has retired. Harrison, with the company since 1952, has been assistant supervisor of employee relations since 1956.

JAMES G. CRAWFORD, Casper petroleum engineer, is going to Jerusalem to train Israeli engineers in core analysis and interpretation. Crawford, president of Chemical & Geological Laboratories, received the assignment from the Technical Assistance Administration of the United Nations.

HOWARD R. TATE, a chemist, has joined the Fifth World Petroleum Congress staff as a consultant. He retired from Esso Research & Engineering Co. after 38 years, most recently as a specialist in arranging large meetings. Tate will handle arrangements for all technical sessions and special events of the Congress, which is to be held in June, 1959, in New York. **Charles B. Towill** has been appointed public relations representative for the Congress. He managed the public relations division of Iranian Oil Participants, Ltd., in London until June of this year.

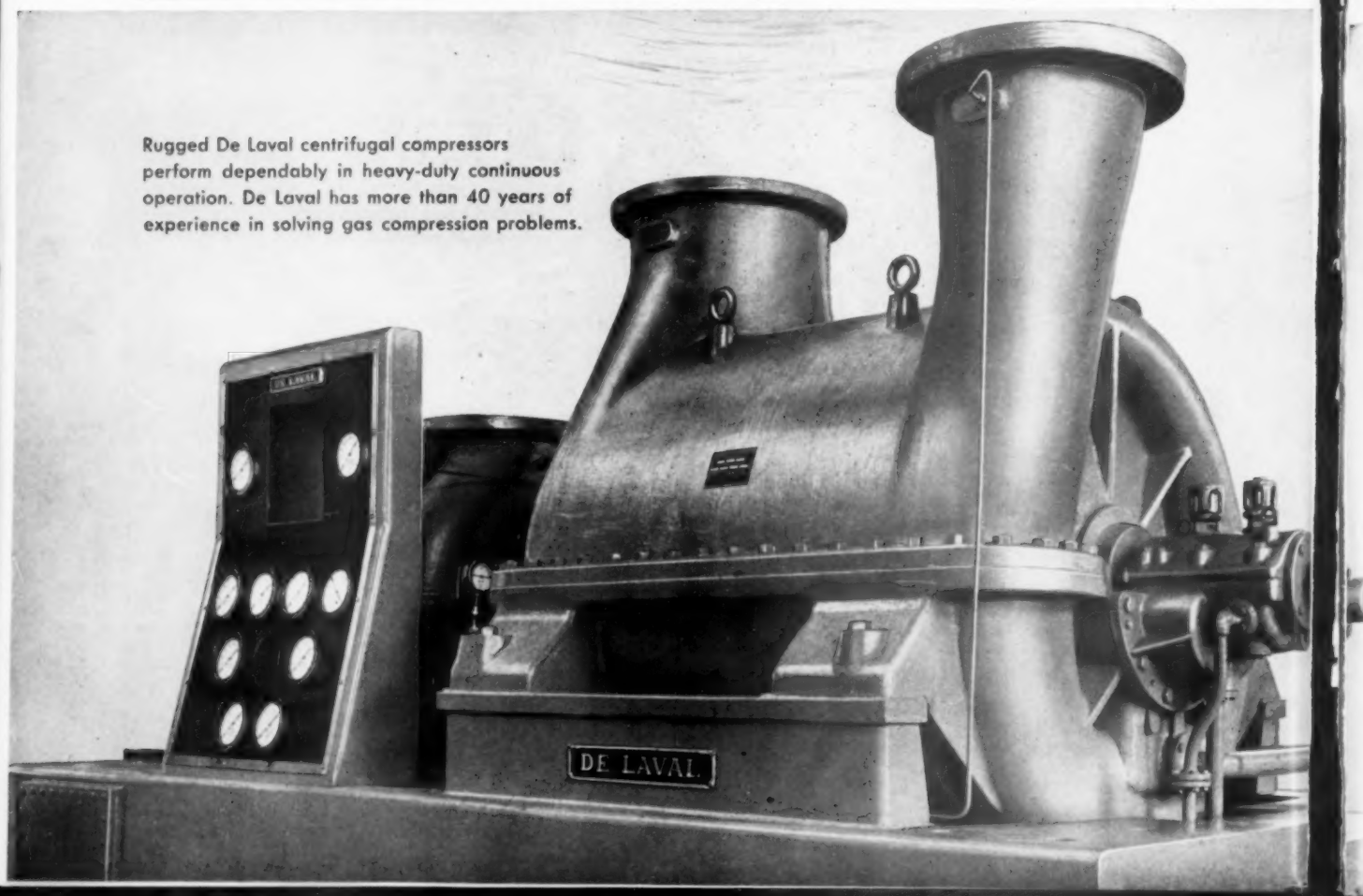
GAYLE E. (Skip) STAHL is to be manager of gas supply for Pioneer Natural Gas Co., Amarillo, Tex. He has been manager of gas purchases for Northern Natural Gas Co. and Permian Basin Pipeline Co. since December, 1955.

M. E. LOOSE, assistant purchasing agent for Ohio Oil Co.'s purchasing division, will succeed **Earl W. Shoupe** as manager. **E. T. Snyder,** also assistant purchasing agent, will take over Shoupe's duties as purchasing agent. Shoupe, with Ohio since 1912, became purchasing agent in 1948, and assumed the title of purchasing manager in 1953. In the company's Shreveport (La.) production division, **G. R. Baldwin,** assistant division landman, succeeds **F. J. Decker** as division landman. Decker has retired after serving the company 43 years.

CLIFFORD J. GURNEY has been named to the newly created post of coordinator of trade relations in the purchasing department of Standard Oil Co. (Ind.). Gurney has been with Soind in the purchasing department since 1920.

D. G. SKAGEN has joined Royalite Oil Co., Ltd., as executive assistant, in Calgary. Skagen, formerly manager of industrial relations for Husky Oil & Refining, Ltd., will assist management on labor relations and employee training and development, and will assist in expanding the company's safety program.

CONTINENTAL OIL CO. has promoted four men to key positions on its Rocky Mountain region geological staff. **John W. Strickland** goes from assistant division geologist to division geologist at Casper, Wyo., succeeding **J. C. Cooper.** Cooper, as previously reported, has transferred to Ft. Worth as assistant geologist for the southwestern region. **Glenn G. Hager,** assistant division geologist, Ardmore, Okla., replaces Strick-


Rugged De Laval centrifugal compressors perform dependably in heavy-duty continuous operation. De Laval has more than 40 years of experience in solving gas compression problems.
DE LAVAL

land in Casper. In Denver, **Charles A. Tallard** becomes regional staff geologist, a new position. **Robert C. Busby,** Casper geologist succeeds Tallard as assistant division geologist, at Billings, Mont.

D. S. HERR and **F. S. SWACKHAMER** have exchanged positions with Shell Chemical Corp. Herr, formerly director of the technical service laboratory in Union, N. J., and Swackhamer, formerly manager of the sales development department, chemical sales division, are assuming one another's jobs. According to **L. V. Steck,** vice-president of marketing, the switch was made "to give each a broader background of experience."

JOHN B. CARRIER, Superior Oil Co., is the new president of the Wyoming Geological Assn., Casper. Other new officers are **Charles M. Chapman,** Mohawk Petroleum Corp., first vice-president; **Paul V. Hoovler,** Sunray Mid-Continent Oil Co., second vice-president; **Glenn Mathers,** Sinclair Oil & Gas Co., secretary; and **John J. Pedry,** Pan American Petroleum Corp., treasurer.

W. D. NOEL is president of the newly organized West Texas Gathering Co., Odessa. Other company officers are **E. G. Rodman,** vice-president; **John B. Shepperd,** secretary-treasurer; and **W. T. Edwards,** assistant secretary-treasurer.

LEO M. WRIGHT becomes assistant chief geologist in Caracas for Sinclair Oil & Refining Co., Venezuela. He was formerly division geologist for Sinclair Oil & Gas Co., another Sinclair subsidiary.

RAUL H. GRAVLEE will be sales manager of the western region, and **Carl J. Kollin** will succeed him as Louisiana division manager, of American Oil Co.'s Pan-Am division, in New Orleans. Gravlee succeeds the late **S. J. Allen;** Kollin was formerly office assistant to Allen.

R. H. Gravlee

H. L. Moir

HARRY L. MOIR is the new general manager of retail marketing for Pure Oil Co., Chicago. He will continue to serve as assistant vice-president for retail marketing, a position he has held since 1951.

DOUGLAS N. EZZELL has been appointed district manager at Ras Tanura for Arabian American Oil Co., succeeding the late **L. H. Rushmer.** Replacing Ezzell as district manager in Abqaiq is **Fred A. Abbott,** assistant district manager. **J. D. Symons,** assistant district manager in Dhahran, is taking over Abbott's position in Abqaiq, and **W. L. Crampton,** acting district manager in Ras Tanura, replaces Symons in Dhahran. In January, **S. C. Harper,** manager of manufacturing and oil supply in New York, will become assistant district manager in Ras Tanura for Aramco. Replacing Harper in New York will be **R. L. Savage,** coordinator of plants and pipelines in the Dhahran general office.

R. E. HUTCHINSON, CARTER WEST, and **ATWELL TESSMAN** will head three newly established district marketing offices for American Petrofina Co. of Texas. Hutchinson, in charge of North Central Texas and Southern Oklahoma, will work out of Dallas; West, in charge of the Lubbock office, will cover the South Plains, Texas Panhandle, and New Mexico; and Tessman, from Mt. Pleasant offices, will be responsible for East Texas, West Louisiana, and Southwest Arkansas.

WALTER RANDALL has joined Plymouth Oil Co. as regional geologist of the Rocky Mountain area, with headquarters in Denver. Randall, with Atlantic Refining Co. for ten years, resigned from the firm in February, 1957, to become a consulting geologist.

RICHARD F. SVOBODA has opened geological consulting offices in Lincoln, Neb. He was formerly associated with the Nebraska Geological Survey.

DE LAVAL
CENTRIFUGAL
COMPRESSOR

helps boost cat-cracker capacity at Shell Oil of Canada, Limited

To obtain extra capacity, the Montreal East refinery of the Shell Oil Company of Canada, Limited decided to rebuild its cat-cracker. Since the modernized cracking unit required a greater volume of air, Shell of Canada selected a dependable De Laval centrifugal compressor handling 16,400 cfm.

This compressor operates at an inlet pressure of 14.3 psia and a discharge pressure of 42.8 psia. The power required is 1860 bhp with the compressor operating at 5400 rpm.

The Shell Oil Company of Canada, Limited is another refinery which has chosen De Laval compressors for heavy-duty continuous service. Whether you need to handle light or heavy gases at high or low pressures in catalytic cracking, reforming, alkylation, coking or any similar service, it pays to look to De Laval.

Send for Bulletin 0504

DE LAVAL *Centrifugal Compressors*

DE LAVAL STEAM TURBINE COMPANY

897 Nottingham Way, Trenton 2, New Jersey

DL378

A. E. Woelfel

A. S. Daniels

ALBERT E. WOELFEL and **A. S. DANIELS** have joined the engineering staff of Cameron Iron Works, Inc., Houston. Woelfel, formerly chief design and development engineer for Ruska Instrument Corp., will work on commercial product research and development projects for Cameron. Daniels, a University of Idaho mechanical engineering graduate, will work on a special project to make stress studies on new company products. An addition to the sales and service force in Gretna, La., is **W. L. McMillan,** who has been an operating engineer with McCullough Tool Co. for the past two years.

J. D. POE has been appointed contract representative of the West Texas-New Mexico division of Loffland Bros. Co. He succeeds **H. J. Shumate,** who as previously reported (PW—Nov.1'57,p52), is moving to New York to manage foreign contracting. Poe, who will make his headquarters in Midland, Tex., has been superintendent of the West Texas-New Mexico division for the past nine years. **R. H. Tipton,** recently appointed acting superintendent of the division, now becomes superintendent succeeding Poe.

CARL J. FULLER has been appointed district sales supervisor in Lodi, N. J., for the ammonia division of Armour & Co. **William O. Passmore** succeeds Fuller as sales representative in the southeastern New York and northern New Jersey areas, while **Peter L. Koehler** replaces Passmore as northern New York sales representative.

FREDERICK W. BRENNION has been named district manager for Boston Woven Hose & Rubber Co., a division of American Biltrite Rubber Co. His district includes the states of Maine, New Hampshire, and Vermont, and portions of Massachusetts and New York.

MILWHITE MUD SALES CO. has purchased National Services, Inc., Oklahoma City independent mud company operating in Oklahoma and Kansas. **Fred Hill,** former president of National Services, has been appointed division manager in Oklahoma for Milwhite. The newly acquired company will distribute Milwhite drilling mud material and chemicals in Oklahoma, Kansas, West Texas, and New Mexico.

MALONEY-CRAWFORD TANK & MFG. CO., is sponsoring **Thomas D. Taylor** and **Ronald G. Bruce,** two University of Oklahoma seniors, for graduate fellowships in chemical engineering. Taylor, from McAlester, Okla., and Bruce, from Ponca City, will enter OU graduate school in February.

R. Z. (Bob) MENDENHALL has joined Macco Oil Tool Co., Houston, as special representative handling foreign and domestic sales. He has been district sales manager for Guiberson Corp., for the past 6½ years.

WENDEL PHILLIPS transfers from Salem, Ill., to Corpus Christi, Tex., as district sales manager for Guiberson Corp. He succeeds **R. Z. (Bob) Mendenhall.**

CHARLES B. KIESEL, JR., has been elected vice-president and a director of Cen-Vi-Ro Pipe Corp., South Gate (Calif.) affiliate of Raymond Concrete Pile Co. Kiesel was recently appointed sales manager of Raymond's prestressed products. In his new post, he will be responsible for Raymond's contacts and relations with Cen-Vi-Ro.

W. R. (Bill) STALLSWORTH will be in charge of the new Woodward (Okla.) office of Schlumberger Well Surveying Corp. He was formerly in Pauls Valley, Okla., for the company. The new office will service the northwestern Oklahoma area.

FRANK L. GOETZ is to be sales manager for water and sewage controls for McIntosh Equipment Corp., New York. Goetz, formerly with Peerless Pump Co., will coordinate sales and promotion of pump controls and telemetering systems to industrial and municipal users.

W. H. STEWART is the new Seattle district manager for the ElectroData division of Burroughs Corp. He succeeds **Meade C. Camp,** who, as previously reported (PW—Nov.8'57, p50), has been appointed Philadelphia district manager. Stewart joined ElectroData in November, 1956, as a sales representative in Seattle.

JOHN P. MOFFATT, JR., has been appointed director of quality control for Consolidated Electrodynamics Corp.'s central manufacturing division, Pasadena, Calif. Moffatt, with the quality control department since 1952, succeeds **A. P. Stuhrman,** division manager, in the post.

W. D. Willes

F. J. Langtry

WELDON D. WILLES has been named general manager, and **FRED J. LANGTRY,** works manager, of Rockwell Mfg. Co.'s Kearney (Neb.) valve plant. Willes has been assistant to the president of the company's Locomotive Finished Material Division, in Atchison, Kan., and Langtry has been assistant works manager of the Oakland (Calif.) plant.

J. B. SPURLOCK has been appointed sales representative of the Flori-Houston pipe fabrication team of Sparton Corp., in Houston. Spurlock, with 30 years' experience in fabrication engineering and sales, will serve New Mexico, Texas, Louisiana, South Carolina, Mississippi, Southern Arkansas, Alabama, Georgia, and Florida.

J. B. Spurlock

W. E. Brice

WILLIAM E. BRICE has been appointed sales representative of Electro-Span digital supervisory control systems for Bendix Aviation Corp.'s Pacific division. William E. Brice Co., which Brice heads, will service Texas, Arkansas, and Louisiana for Bendix.

CLASSIFIED

DISPLAYED RATE

The advertising rate is $12.00 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request. Employment opportunities—$17.05 per inch, subject to Agency Commission.

UNDISPLAYED RATE

$1.50 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)

POSITION WANTED. Undisplayed rate is one half of above rate payable in advance.

PROPOSALS, $1.50 cents a line an insertion.

INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

BUSINESS OPPORTUNITY

Utah U. S. Gov't. 5 year oil leases. Any citizen may get one. Free information. John L. Donahue, 430—16th Street, Denver 2, Colorado.

FOR SALE

Complete small refinery ready to operate, 2500 b/d crude still, 1200 b/d Thermal Cracker, 80,000 bbls. tankage, Ethyl Gasoline Blending Plant, Office Building, Laboratory Building, Tanks with Loading Rack, formerly Jet Fuel production, 10 acres. Price $125,000 for immediate sale. Location, Palestine, Texas.

Phone S. J. Cohen, Dallas, Riverside 1-4645. Write BO-6581 Petroleum Week 520 N. Michigan Ave., Chicago 11, Ill.

LEVI A. HAYS has been named district manager of the newly opened Dallas branch of Applied Power Equipment & Mfg. Co., distributor of Allis-Chalmers and Buda Division engines and generator sets. The office manager is **M. J. Rigby,** and **Arno Schubert** is parts manager. All three men have had several years' experience in the engine business with Buda Engine & Equipment Co. and Allis Chalmers.

HAROLD E. McGOWEN, JR., has been elected president of Camco, Inc., Houston gas lift equipment and wire line service company. All other officers and directors have been re-elected.

C. J. ERWIN has been appointed export manager, and **H. D. (Bob) Robinson** becomes assistant export manager, for Houston Oil Field Material Co., in New York. Erwin, with Homco since 1944, has been division manager of services for Louisiana and Mississippi, in New Orleans; Robinson has been resident manager at Tulsa.

W. J. (Bill) NUTTO is the new Louisiana Gulf Coast agent for "driltrol" Corp., makers of drillable wing stabilizers. Assisting Nutto in charge of field service will be **Frank Cox,** directional drilling service man in the Gulf Coast region for the past five years. Nutto, who will have headquarters in a newly established office in Lafayette, has served as sales manager of both Reed Roller Bit Co. and Hunt Tool Co.

W. J. Nutto

O. D. Myrick, Jr.

O. D. MYRICK, JR., will direct the newly organized development planning department of the Davis Chemical Co. division of W. R. Grace & Co., in Baltimore. He formerly was manager of development for the research and development department. The new department's responsibilities will include market research and technical and economic valuations.

JIMMIE H. GOSS has been appointed sales representative in Toledo, Ohio, for National Supply Co.'s eastern division. He succeeds **David E. Bayer,** who has transferred to Charleston, W. Va., as assistant district manager. Since 1955, Goss has been district sales representative in Olney, Ill.

JAMES L. REEVES becomes a chemical engineer for George Armistead & Co., Washington (D. C.) engineering firm specializing in services for the refining and petrochemical industries. For the past six years, he has been a process engineer for Esso Standard Oil Co.'s Baltimore refinery.

ADVERTISERS IN THIS ISSUE

Allied Chemical & Dye Corp. Nitrogen Div. 124
American Marine Corp. 42
American Petroleum Institute 175
Babcock & Wilcox Co. 103
Bakelite Co., Div. UCC 16
Baker Oil Tools, Inc. 20-21
Bank of Montreal 71
Baroid Div., Nat'l. Lead Co. 82-83
Beaird Co., Inc., J. B. 59
Beckman Instruments, Inc. 78
Bell Helicopter Corp. 14
Brown Oil Tools, Inc. 37
Brown & Root, Inc. 41
Butler Mfg. Co. 120
Cameron Iron Works, Inc. 64
Canadian Bank of Commerce 147
Chiksan Co. 7
Cities Service Petroleum, Inc. 139
Continental Oil Co. 169
Crose Mfg. Co., M. J. 90-91
Curtiss Wright Corp. 137
Davison Chemical Co. 162
DeLaval Steam Turbine Co. 176, 177
Dowell, Inc. Cover 3
Dresser Industries, Inc. 88-89
Dresser Industries, Inc., Turbodrill Div. 35
Drilling Specialties, Co. 43
DuPont de Nemours, E. I. 131-132
Eastman Chem. Products, Inc. 19
Elgen Corp. 51
Esso Research & Engr. Co. 31, 107
Ethyl Corp. 86-87
First Nat'l. Bank of Chicago 127
First Nat'l. Bank in Dallas Cover 2
First City Nat'l. Bank of Houston 157
Fish Engineering Corp. 8
Gen'l. Amer. Transp. Corp., Plate & Welding 143
Gen'l. Amer. Trans. Corp., Tank Car 144
Gen'l. Amer. Transp. Corp., Terminals 145
Gen'l. Electric Co., X-Ray Div. 123
Geophysical Service Inc. 54
Goodyear Tire & Rubber Co. 1
Graver Tank & Mfg. Co., Inc. 72
Gravity Meter Exploration Co. 46
Gulf Oil Corp. 104
Hammond Iron Works 65
Hercules Tool Co. 66
Hewitt-Robins 168
Houdry Process Corp. 80
Hudson Engineering Co. 112
Hughes Tool Co. 49-50
Humble Oil & Refining Co. 9
Ideco, Inc. 84-85
Ingalls Shipbuilding Corp. 167
Ingersoll-Rand Co. 15
Jones & Laughlin Supply Div. 111
Kellogg Co., M. W. Cover 4
LeTourneau, Inc., R. G. 61
Liberty Mfg. Co. 57
Lucey Export Corp. 152
Magnet Cove Barium Corp. 97
McNamar Boiler & Tank Co. 129
Mercantile Nat'l. Bank 167
Mercoid Corp. 142
Metals Disintegrating Co. 38
Mid-Continent Supply Co. 12
Milwhite Mud Sales Co. 32
Morgan Stanley & Co., Inc. 115
Nordstrom Valve Div., Rockwell Mfg. Co. 67-68
North American Car Corp. 4
Oakite Products, Inc. 76
Offshore Exploration Group 60
Oil Center Tool Co. 159
Oilwell Supply Co., USS 149
Oronite Chemical Co. 170
Parkhill Truck Co. 133
Petreco Div., Petrolite Corp. 160-161
Petro-Chem Development Co., Inc. 2
Petroleos Mexicanos 130
Philco Corp. 47
Polyken Sales Div., Kendall Co. 173
Price Co., H. C. 22
Procon, Inc. 79
Raymond Concrete Pile Co. 13
R. C. A. Communications Products 171
Reed Roller Bit Co. 94-95
Refinery Engineering Co. 116
Republic Nat'l. Bank of Dallas 3
Republic Supply Co. 39
Reynolds Metals Co. 5
Ridge Tool Co. 73
Roebling's Sons Corp., John A. 119
Rolo Manufacturing Co. 53
Royal Bank of Canada 45
Royal-McBee Corp. 138
Schlumberger Well Surveying Corp. 98
Sheehan Pipeline Construction Co. 141
Shell Chemical Corp. 81
Southern Marine & Aviation Underwriters, Inc. 158
Southern Pipe & Casing Co. 55
Stewart & Stevenson Services, Inc. 10
Sun Oil Co. 150
Sun Shipbuilding Dry Dock Co. 11
Tidewater-Virginia Development Council 172
Tracer Lab 58
Tretolite Div., Petrolite Corp. 74
Unit Rig & Equip. Co. 93
Universal Oil Products Co. 6
Vertol Aircraft Corp. 63
Warren Petroleum Corp. 172
Waukesha Motors Co. 77
W-K-M Mfg. Co. 155

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

BUSINESS OPPORTUNITIES 179

PETROLEUM WEEK REPRESENTATIVES

Atlanta 3 — Douglas C. Billian
1301 Rhodes-Haverty Bldg.
Jackson 3-6951

Boston 6 — Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11 — W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15 — J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Denver 2 — John W. Patten
1740 Broadway
Alpine 5-2981

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Madison 6-9351

New York 36 — Edward A. Callahan, Jr.
Donald R. Thompson
500 Fifth Ave.
Oxford 5-5959

Philadelphia 3 — W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 19 — J. A. Hartley
209 Constantine Bldg.
611 South Boston
Gibson 7-5594

England, London, E. C. 4 — Herbert Lagler
McGraw-Hill Co., Ltd.
95 Farringdon St.

It's Time To Face the Facts

WE HOLD NO BRIEF for the importing companies, nor for any one segment of the oil industry over another. But let's face the facts.

Even though it now appears that the voluntary import control plan will work—i.e., crude imports will be held close to the recommended level—the industry is still faced with serious economic problems.

Added together, the problems sum up to a critical oversupply. It is not a new condition for the oil industry. Oversupply has been a problem during most of the postwar years. About the only change that can be noticed is that the problem seems to grow more acute with each passing year.

NEARLY EVERY OIL MAN at the API meeting in Chicago this week is concerned with the problems that have been created.

Producers, particularly, are quite worried about the future. U.S. crude output has been held low since late spring. Few, if any, producers expect a substantial increase in the near future. They base their thinking on these facts:

- Demand is not expected to show any big gain. At best, present estimates show a rise of 1% in total demand in 1958.
- Gas liquids and field condensate are making steady inroads—now amounting to nearly 1-million b/d—into crude markets.
- Product stocks continue to be excessive, molding a damper on possible increases in production.

THE ECONOMIC PROBLEMS ARE SERIOUS for the whole industry. Product prices have been under pressure most of the year. Gasoline prices were weak in the summer, when demand for motor fuel was at a peak. Now distillate prices aren't particularly strong—and until last week they were weak—just as the heating season is getting under way.

Some independent refiners have been especially hard hit. And even some major integrated companies reflected the impact in their third quarter earnings.

Producers so far have been spared the financial stab of a general cut in crude prices. But pocketbooks have been squeezed by the effects of tight allowables, purchaser proration, and some scattered downward "adjustments" in crude prices.

There is even talk of a widespread crude price cut.

The imports problem has been partially solved—for the time being, at least. But all of the other problems are still with the industry. And no immediate solution is in sight.

"BLIND" ACIDIZING CAN BACKFIRE

Case In Point: McClosky Limestone

This formation tested 93 to 99 per cent soluble in acid, yet regular acid treatments often reduced, rather than increased, production. The obvious conclusion was emulsion block, but ordinary emulsion breakers were not effective.

Dowell engineers obtained cores and formation fluid for laboratory investigation. The result: it was discovered that an unusual emulsion was being formed during acidizing. The laboratory recommended a special addition agent which was mixed with the acid to prevent emulsion. Immediately, results of treatments with this Dowell "tailored acid" became consistently successful, as the bar charts show.

Because of the varying characteristics of limestone, there is usually a need for "tailored acid" to get best results. Dowell's extensive laboratory facilities, with more than forty proved addition agents for acid treatments, are at your disposal.

For more information or service, call any of the 165 Dowell offices in the United States and Canada; in Venezuela, contact United Oilwell Service. Or write Dowell Incorporated, Tulsa 1, Oklahoma.

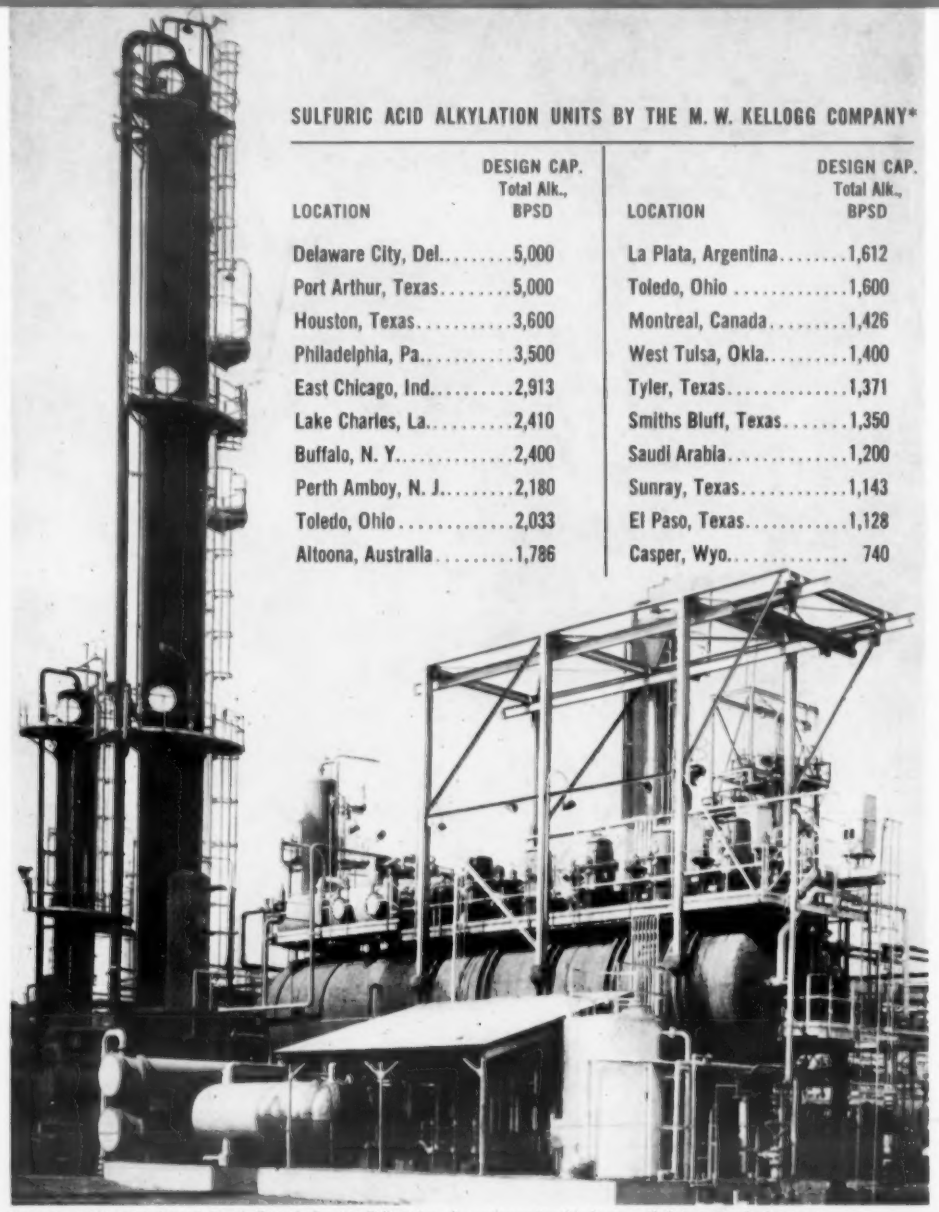
25 years forward

Services for the oil industry

DOWELL

A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY

Today's Ultimate in ALKYLATE



SULFURIC ACID ALKYLATION UNITS BY THE M. W. KELLOGG COMPANY*

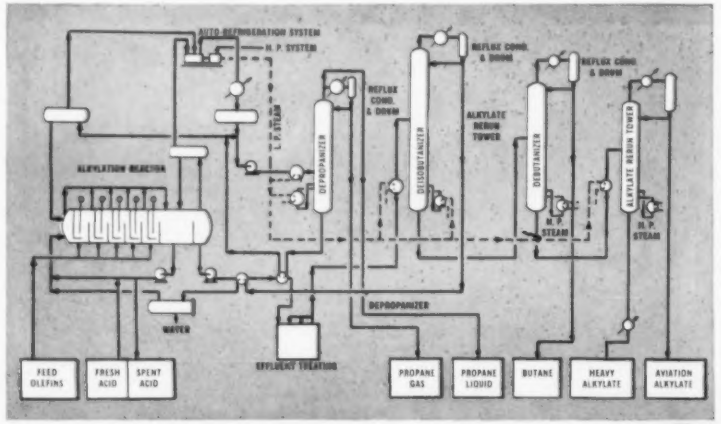
LOCATION	DESIGN CAP. Total Alk., BPSD	LOCATION	DESIGN CAP. Total Alk., BPSD
Delaware City, Del.	5,000	La Plata, Argentina	1,612
Port Arthur, Texas	5,000	Toledo, Ohio	1,600
Houston, Texas	3,600	Montreal, Canada	1,426
Philadelphia, Pa.	3,500	West Tulsa, Okla.	1,400
East Chicago, Ind.	2,913	Tyler, Texas	1,371
Lake Charles, La.	2,410	Smiths Bluff, Texas	1,350
Buffalo, N. Y.	2,400	Saudi Arabia	1,200
Perth Amboy, N. J.	2,180	Sunray, Texas	1,143
Toledo, Ohio	2,033	El Paso, Texas	1,128
Altoona, Australia	1,786	Casper, Wyo.	740

*List shows only units utilizing Kellogg's Cascade Reactor. Kellogg has also engineered and built many alkylation units of other types.

Measured by every standard . . . by quality and quantity of yield . . . by initial investment . . . by operating costs . . . M. W. Kellogg's sulfuric acid alkylation process is bringing optimum results to an increasing number of leading refiners both at home and abroad.

With its present advanced design, utilizing the company's unique multiple-stage cascade reactor and auto-refrigeration system, Kellogg alkylation offers the ultimate today in high isobutane efficiency, low acid consumption, low outlay for recycle and auxiliary equipment, and low utilities cost.

The M. W. Kellogg Company welcomes the opportunity to describe this alkylation process in detail, and to acquaint refiners with the improvements its engineers are continually making toward still greater economy and efficiency.



Refinery Process Division

The M. W. Kellogg Company

711 Third Avenue, New York 17, N.Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

The Canadian Kellogg Company Ltd., Toronto • Kellogg International Corp., London • Kellogg Pan American Corp., New York • Societe Kellogg, Paris • Companhia Kellogg Brasileira, Rio de Janeiro • Compania Kellogg de Venezuela, Caracas